

**INTERDISCIPLINARY INTERNATIONAL SEMINAR**

**Agriculture and Rural Development: Spatial**

**Issues, Challenges and Approaches**

**15<sup>th</sup> December, 2018**

**Organizer**

**Department of Geography,**

**Shri Shahaji Chhatrapati Mahavidyalaya, Kolhapur**

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## MESSAGE

I am very happy to know that the Department of Geography, Shri Shahaji Chhatrapati Mahavidyalaya, Kolhapur is organizing One Day Interdisciplinary International Seminar on "Agriculture and Rural Development: Spatial Issues, Challenges and Approaches" on 15<sup>th</sup> December, 2018.

The theme of the conference is very vital in the present day context and I am sure that there will be meaningful interaction and exchange of information on the main theme and sub-themes of the Seminar. I am confident that the deliberations will be very fruitful and the participants will richly benefit from it.

I wish the One Day Interdisciplinary International Seminar a grand success.

Kolhapur  
Date: 07/12/2018

  
(Devanand Shinde)  
Vice-Chancellor



### ***Message...***

I wish heartily for the International Seminar organised by the Department of Geography, Shri Shivaji Chhatrapati Mahavidyalaya, Kolhapur of our institution on "**Agriculture and Rural Development : Spatial Issues, Challenges and Approaches**" are beign discussed on the occasion of this Seminar. Many foreign and Indian delegates, researchers, professors are visiting the premises of the institution. I think this is the most important moment in the history of the institution which is progressing after its centenary contribution in the field of education. Once again I wish grand success for this Seminar from the bottom of my heart.

**Shri. Mansing Vijayrao Bondre**

Chairman,

Shri Shahu Chhatrapati Shikshan Sanstha, Kolhapur



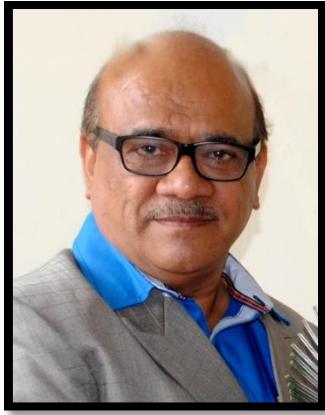
### ***Message...***

The Department of Geography of Shri Shahaji Chhatrapati Mahavidyalaya, Kolhapur has organised the International Seminar on "**Agriculture and Rural Development : Spatial Issues, Challenges and Approaches**". I acknowledge the massive efforts taken by the Department of Geography and others, involved in organising this Seminar. I am sure that very important issues will be discussed by the participants and this will enlighten the society. On the behalf of the institution, I wish great success for this International Seminar.

**Shri.Vijayrao Shripatrao Bondre**

**Hon. Secretary,**

**Shri Shahu Chhatrapati Shikshan Sanstha, Kolhapur**



### ***Message...***

I am extremely exulted to know that the Department of Geography from Shri Shahaji Chhatrapati Mahavidyalaya, Kolhapur is organising a One-day Interdisciplinary International Seminar on "**Agriculture and Rural Development : Spatial Issues, Challenges and Approaches**" on 15<sup>th</sup> December, 2018.

I am sure that the issues to be presented and deliberated during the Seminar will be very beneficial for the society. I hope that the Seminar will provide a meaningful platform for the young researchers and academicians to present their views.

I wish the International Seminar will be of a grand success.

**Dr. D. R. More**  
Academic Advisor,  
Shivaji University, Kolhapur





## सस्नेह निमंत्रण

श्री शहाजी छत्रपती महाविद्यालय, भूगोल विभाग, कोल्हापूर  
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“Agriculture and Rural Development : Spatial Issues, Challenges and Approaches”

शनिवार दि. १५ डिसेंबर २०१८

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## आंतरराष्ट्रीय चर्चासत्राच्या निमित्ताने.....

आमच्या श्री शहाजी छत्रपती महाविद्यालयामध्ये शनिवार दि. १५ डिसेंबर २०१८ रोजी आंतरराष्ट्रीय चर्चासत्राचे आयोजन होत आहे. २०१८-१९ या शैक्षणिक वर्षामध्ये भूगोल विभागाने या चर्चासत्राचे आयोजन करून शिवधनुष्य पेलण्याचे आव्हान स्वीकारले आणि पेललेही. या बदल सर्वप्रथम या विभागाचे मनःपूर्वक अभिनंदन!

एकविसाव्या शतकाची सुरुवात होत असताना विज्ञान क्रांतीने अनेक नव्या प्रश्नांची उकल होत आहे. प्रत्येक नवा दिवस नवा विचार घेऊन येत आहे. जग नव्या आव्हानांना सामोरे जात आहे. एकाअर्थी, मानवासमोरील समस्या आणि आव्हानांची मालिका संपता संपत नाही. कोणतेही क्षेत्र यापासून दूर नाही. ही परिस्थिती लक्षात घेऊन भूगोल विभागाने **"Agriculture and Rural Development: Spatial Issues, Challenges and Approaches"** असा विषय या चर्चासत्रासाठी निवडला.

शेतीच्या पर्यायाने ग्रामीण अर्थव्यवस्थेच्या दृष्टीने आजची स्थिती अतिशय अस्वस्थ करणारी आहे. जागतिकीकरणाच्या धोरणामुळे अनेक संदर्भ बदलत असून त्याचा शेती व ग्रामीण विकासावर मोठा परिणाम झाला आहे. महाराष्ट्रातील दुष्काळ, शेतकऱ्यांच्या आत्महत्या ही या संदर्भातील ज्वलंत उदाहरणे आहेत. देशातील कृषी क्षेत्र हे अविकसीत क्षेत्र म्हणून ओळखले जाते. त्यामुळे शेती क्षेत्राचा विकास गरजेचा आहे. शेती आणि ग्रामीण विकासाच्या अनुषंगाने नवनवीन प्रयोग होत आहेत. शेतीमध्ये मोठ्या उत्पादनाच्या हव्यासापोटी विविध खतांचा, औषधांचा वारेमाप वापर होत आहे. यातूनच मानवासमोर अनेकविध समस्या आणि आव्हाने येऊन पुढे ठाकली आहेत. या वस्तुस्थितीचा विचार करून भूगोल अभ्यासक, संशोधक व विविध क्षेत्रातील साधनव्यक्ती यांच्या चर्चेतून या समस्येची उकल व्हावी या उद्देशाने भूगोल विभागाने **"Agriculture and Rural Development : Spatial Issues, Challenges and Approaches"** असा विषय या चर्चासत्रासाठी निवडला आहे. या विषयाची व्याप्ती नैसर्गिक व मानवी सर्वच घटकांना स्पर्श करणारी असून सर्वच शास्त्रांसह भाषा आणि साहित्यालाही या विषयामध्ये समाविष्ट करण्यात आले आहे. या विषयाच्या अनुषंगाने विविध विषयांतील २५० हून अधिक शोधनिबंध प्राप्त झाले असून या सर्व लेखांचा समावेश प्रस्तुत ई-जर्नल मध्ये करण्यात आला आहे.

भूगोल विभागाने आयोजित केलेल्या या चर्चासत्राच्या यशस्वीतेमध्ये अनेकांचा हातभार आहे. विशेषतः आमच्या श्री शाहू छत्रपती शिक्षण संस्थेचे चेअरमन मा. श्री. मानसिंग विजयराव बोंद्रे व मानद सचिव मा. श्री. विजयराव श्रीपतराव बोंद्रे यांनी या चर्चासत्रास परवानगी देण्यासह सर्वतऱ्हेची मदत केली. कोल्हापूर जिल्हा दूध उत्पादक संघ लि., कोल्हापूर म्हणजे 'गोकुळ' दूध संघाने या चर्चासत्रासाठी भरीव मदतीचा हात पुढे केला आहे.

शेती विषयावरील या चर्चासत्राच्या यशस्वितेसाठी शिवाजी विद्यापीठाचे कुलगुरु आदरणीय प्रा. डॉ. देवानंद शिंदे, शैक्षणिक सल्लागार डॉ. डी. आर. मोरे, गोकुळचे चेअरमन श्री. विश्वासराव पाटील, संचालक बाळासो खाडे, डॉ. बी. एन. खापणे सर, डॉ. प्रवीण सत्पर्षी, डॉ. अ. एस. जाधव, डॉ. के. सी. रमोत्रा, डॉ. जे. सी. मोरे, डॉ. टी. एन. लोखंडे, डॉ. बी. एस. जाधव, डॉ. अ. एच. मुसनुळे, महाविद्यालयाचे प्रबंधक श्री. रवींद्र भोसले, अधीक्षक श्री. मनिष भोसले, भूगोल विभाग प्रमुख प्रा. आर. एम. कांबळे, डॉ. डी. एल. काशिद-पाटील, डॉ. सौ. एन. डी. काशिद-पाटील, प्रा. अविनाश वर्धन, डॉ. स्वप्निल बुचडे, कु. प्रतिक्षा पाटील, कु. ऋतुजा पाटील यांच्यासह संयोजन समितीतील सर्वांचे महत्त्वपूर्ण सहयोग व मार्गदर्शन लाभले. या चर्चासत्राच्या निमित्ताने विविध महाविद्यालयातील प्राध्यापकांची संयोजन व सल्लागार समिती नेमण्यात आली आहे. या समितीने मौलिक सूचनांसह मार्गदर्शन केले. चर्चासत्राच्या निमित्ताने संपूर्ण महाविद्यालयीन प्रशासन, प्राध्यापक, कर्मचारी एकदिलाने अखंडितपणे कार्यमग्न राहिले. या चर्चासत्राच्या निमित्ताने ई-जर्नलची जबाबदारी लातूरच्या श्री. प्रमोद तांदळे यांनी घेतली व अतिशय सुबकपणे नियोजित वेळेत ई-जर्नल पूर्ण केले.

आपण सर्वांनी चर्चासत्र यशस्वी व्हावे यासाठी मनापासून मदत व शुभेच्छा दिल्या यामुळे चर्चासत्र यशस्वी होत आहे याची मला जाणीव आहे. सर्वांचे मनापासून धन्यवाद व आभार!

- डॉ. आर. के. शानेदिवाण

प्राचार्य, श्री शहाजी छत्रपती महाविद्यालय, कोल्हापूर



### ***Editorial.....***

I am very happy to present this e-journal of the Interdisciplinary International Seminar on “Agriculture and Rural Development: Spatial Issues, Challenges and Approaches.” I sincerely hope that the purpose of the seminar has been served through discussion of issues by the resource persons and participants of this seminar.

The Department of Geography of Shri Shahaji Chhatrapati Mahavidyalaya, Kolhapur has always been actively organizing different academic and co-curricular activities that would help to enhance the knowledge of students and researchers. The Department of Geography is greatly honored in hosting the International Seminar on this theme. This seminar aimed at providing a platform to academicians, researchers, students and stakeholders to discuss varied issues regarding agriculture and rural development. This seminar will be an excellent opportunity for the participants to interact and exchange ideas and to discuss new development in these disciplines. I also know that fast development is significantly linked with self-sufficiency in agricultural production. In order to be self-sufficiency in agricultural produce, there has been widespread use of chemical fertilizers and pesticides which have adversely affected the environment by polluting natural resources like water, air and soil. This present seminar will give an insight into International and national level policies, issues, challenges, planning, management and utilization of resources for development of agriculture.

I have received research papers covering the various disciplines in geography, agriculture, rural development, marketing geography, tourism geography, human resource development, remote sensing, medical geography, industrial geography, commercial geography and social science.

I express sincere thanks to Shri. Vishwas Narayan Patil, Chairman, Kolhapur Zillha Dudh Utpadak Sangh ( Gokul ) Ltd. Kolhapur for the financial support to organize the present International level seminar of Geography.

I take this opportunity to extend our sincere thanks to the researchers and the chairman, reporters, members of BoS.

I express my Sincere, thanks to Prof. Dr. Devanand Shinde, Vice-Chancellor Shivaji University, Kolhapur for precious guidance for this Seminar. I also express my sincere thanks to Shri. Mansing Bondre, President and Shri. Vijayrao Bondre secretary, Shri Shahu Shikshan Sanstha Kolhapur. I give my

special thanks to our principal Dr. R. K. Shanediwan for valuable support and guidance. I would like to thank Shri. R.M. Kamble, Head, Department of Geography for his co-operation. I am extremely grateful to Dr. A. B. Patil ( Ex. BoS) chairman of Shivaji University, Kolhapur. I would like to thank Dr. S. D. Shinde [BoS] chairman, Dr. C. U. Mane, Dr. B. S. Jadhav for their support. Without the support of Dr. Mrs. N. D. Kashid-Patil, Dr. Mrs. S. V. Gaikwad, Shri. S. V. Chougule, Shri. Santosh Zitre and my colleagues, Registrar Shri R. J. Bhosale, Office superintendent Manish Bhosale and non-teaching Staff and students of the geography department this seminar would not have been a great success. My sincere thanks are due to keynote addresser and all the resource persons who have shared their valuable knowledge with delegates by delivering lectures and also to the participants for their contribution to this seminar. I would like to thank Mr. Pramod Tandale, Chief Editor of [AIIR] Peer-Review and Indexed Journal for his co-operation and efforts for publishing the research papers well in advance.

In this e-journal I have included various articles on a number of relevant issues. I would like to declare that financial responsibility of the facts, figures and opinions expressed in the research papers and articles lies with the concerned authors. I have taken almost care to avoid printing mistakes in this e-journal. However, I apologize for any mistakes that may have occurred unknowingly. Once again I express my sincere gratitude to all of them who have helped me directly or indirectly for the outcome of this e-journal successfully.

**Dr. D. L. Kashid-Patil**  
Co-ordinator



# **Agriculture and Rural Development: Spatial Issues, Challenges and Apprpaches**

## Keynote Address

By

**Praveen G. Saptarshi**

### **Fellow delegates,**

I congratulate the organizers and college management for selecting socially relevant theme for the seminar. It is well known fact that agriculture is the basic sector for rural development mainly because it is responsible for development of resources both natural and human. However, the same sector is under threat in the recent past. Capacity building has been essential in the wake of global environmental issues like climate change. Instead, the resource base of agriculture and hence rural development is being exploited, at times dented and destroyed, by the other sectors. It is necessary that geographers should develop their ability to analyze region specific issues and understand the challenges of sustaining wellbeing of farmers.

### **History of Agricultural Development:**

The first Prime Minister of India said that the cooperative sugar factories should become instrument of rural development at the time of inauguration of first cooperative sugar factory in Maharashtra. One has to admit that establishment of such factories have certainly achieved rural development to some extent. Why does it collapse? Why are we switching over to privatization? Does history of development taught us to change the policies? Several academicians think corruption is the root cause of the issues. Geographers are well trained in adopting integrated approach and hence we are not expected to accept such views of lazy thinkers.

We may look at another significant step of agricultural development, i. e. green revolution, which is considered as great achievement. After green revolution we have achieved food security and increased export of agro-based products like sugar, vegetables, flowers and fruit. Exporting table grape by adopting post harvest technology and overseas container transportation, can be a great achievement. More importantly, this has happened in the areas of light soils and low rainfall. Grape growers must be congratulated for this kind of achievement. This too, has ceased to achieve rural development. Why such achievements could not sustain longer? This conference should be able to find out how and why this situation is created.

### **Symptoms and Causes:**

With due appreciation for successful improvement in agricultural productivity geographers should see other side of the coin. They are well trained in appraisal and management of resources. We know that soil formation process is too slow taking about millions of years to complete. It may be a classical example of nature–human relationship developing good traditional agricultural practices in diversified climatic conditions and soil characteristics. However, with the introduction and later on dominance of industrial sector

and market economy we are losing our traditional strength to protect natural capital in the form of soil and water resources. This has led to significant loss of agricultural resources. Additionally, the profitability of farmers has declined considerably and risk sharing increased up to almost 100%. The effect is visible. Those who were responsible for malfunctioning of co-operative sugar factories have purchased the same. Co-operative sector has been deliberately destroyed and that has been the start up for retarding rural development in the state and country as well. The implication is not just economic. The political power of rural leadership has been reduced.

### **Challenges:**

Rural sector is facing the main challenge of lack of capacity building for sustainable growth. Some of the well-felt challenges are outlined here in brief.

#### **1. Deterioration of Water resource:**

The farmers were at risk due to vagaries of monsoon in the past. They were having support from the groundwater resource. However, a study of drought prone region has revealed that severity of groundwater depletion is high in irrigated areas because of technology diffused in rural areas and irrigated farmers have financial capability to access it. Therefore this resource has become highly concentrated or diverted to rich peasantry making deprivation for majority of farmers.

Presently, water resources are being diverted to urban and industrial sector. More importantly, these sectors are responsible for polluting natural water bodies like rivers, tanks, and lakes, along with backwaters of dams. This is the major premise for shifting of political power towards extreme right.

#### **2. Market Economy:**

The farmers are encouraged to adopt agricultural practices for market economy, especially after globalization. However, they are facing the risks due to fluctuations of market prices of agricultural goods, banking policies, power crisis and exploitation by industries and socio-political oppression. Can we analyse the situation in the context of resource base and wellbeing of small and marginal farmers? This is an attempt to suggest how geographers can carry out grass-root study to find out strategy. Some of the studies in this direction may be useful.

#### **3. Rural to Urban Cash flow:**

There are several research papers in geography to prove that root cause of agricultural problems is 'outgoing cash flow'. The studies carrying out cost-benefit analysis, have revealed that very small part of income through agriculture based on local soil, water and human resources, remain in the rural areas. More than 65% of the profit goes to urban sector. This means that agriculture should be developed as the close system in which a little or no scope is provided to transgress the earnings in agriculture to other sectors. Organic farming can be promoted in this context. More importantly, transfer of money or goods should be viewed as transfer of resources. We export agricultural commodity like sugar meaning thereby exporting high amount of water. Is it geographically sound to export water from the regions where water scarcity is severe problem?

#### **4. Capital Loss:**

It may be considered as criminal act to destroy soils by improper use of chemical fertilisers and water. All the irrigated areas in the country have shown soil degradation and deterioration of water quality. Most of the water bodies are polluted showing high BOD, EC and TDS mainly due to nutrient pollution due to mixing of urban sewage and industrial effluent. Scarcity of safe drinking water, even in the vicinity of dams, is the resultant effect of indiscriminate use of resources by both agriculture and industry sector.

These are the challenges closely related to development of farming sector in the country. They are well rooted in our social, political and economic system. After globalised world they are linked with corporate sector of the world, which has dominated the political scenario. Therefore we have to find out political solution to regain sustainability in agriculture and rural development.

#### **Approach for Rural Development:**

Once we know the issues at grass root level we can able to strategize the use of natural resources like soil, water and biomass. Furthermore, it is necessary to have effective check on diversion of resource through socio-political and economic system. For this, common farmers in the rural areas should be empowered in the democratic system so as to reduce exploitation of both natural and human resources. This may achieve participatory agricultural development for farmers' prosperity. It is in this context I would like to put forth a model, which may be called as "Farmers' Model".

#### **Farmers' Model:**

The model is based on the principle of rural development with farmers at the center. Therefore it advocated agronomy based on region specific agro-ecosystem. The model attempts to prove with statistical methods that reducing consumption of fertilizers and pesticides increases the farmers' benefits. It also advocates optimization of cropping pattern. For regaining political power for farmers it is necessary to restore democracy. For restoring democracy in true sense of the term it is necessary to empower farmers. Checking capital loss and reducing urban-industrial inputs it can be possible.

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## Failure of Agricultural Management Leading to the Farmers Death or Suicides in India

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*Modern states are welfare states and the motto of bureaucratic administration is to introduce welfare measures for the benefit of society. 'Democracy' is a peculiar form of government. Democracy is aimed at bringing lot of changes into the living style of the people. The organs of the government such as legislature, executive and judiciary have made determination to create awareness among the people to safeguard their rights as enumerated in the Indian constitution. The global policies like globalization, privatization and liberalization have made some negative impacts on society and affected to the public administration and Agricultural families of Indians.*

*The globalised markets have caused convergence of relations among states, societies, bureaucracy, corporate sector, media, information and communication technologies and transformed the context and process of neo-liberal governance. In this juncture, here the people seek government support to lead day-today life in order to fulfill their basic needs. Human Society always conducts several transactions with government for fulfillment of their needs. The Neo-Liberal Democratic policies of the government coping with the challenges and compulsions of governance and they have been obstacles for the welfare measures of the state.*

*Public Administration is the heart of the modern states. According to L.D.White "Administration is a moral act and administrator is a moral agent" {White L.D. Introduction to the Study of Public Administration, 4<sup>th</sup> Ed.,P.,xvi} The social, political and economical justice can be accessed through administration wing of the government. The impact of globalization has resulted in the declining role of the state. Democratic administration and public welfare are put in crisis. The Globalization, Privatization and Liberalization process have posed threats to the present public administration.*

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Today the government is spending 50 to 60 per cent of its income for public expenditure in the globalised world but it is not working effectively. Public administration converted from "**Civil administration to non-civil administration**" means government giving more importance to corporate sectors. The public are threatened by market chaos under economic and social pressures due to globalization and marketisation. The interference of globalization and market failure will be resulting in government intervention towards agricultural sector but the same was not taken place in India.

Even after 70 years of Independence majority of Indians are not comfort with their rights such as right to employment, food, pure drinking water, shelter and health. The condition of rural farmers is still very critical, majority of families are depending on agriculture and related activities. India is the country where 73 per cent of total population lives in villages.

### Objectives

Here some objectives have been framed to study the statement of problem.

1. To study the level of awareness among farmers about public administration.
2. To assess and examine the impact of globalization on agricultural community.
3. To study the capacity of farmers converting them traditional farming advanced one.
4. To study the attitudes of the political leaders and agricultural department over the corrupt practices in the state.
5. To study the living style of farmers in the way of traditional and modern standard.

### Hypotheses

Some hypotheses have been employed to conduct research analysis over the farmers' suicides and agricultural administration.

1. The farmers' awareness is closely linked with social security.
2. The degeneration of human values leads to suicides or deaths.
3. Non- corrupt system change the socio-economic life style of farmers.
4. No participation of the farmers in governance leads to bad governance.
5. More participation of the farmers in agricultural matters leads to good governance.

### Scope Of The Study

This research study is aimed at bridging the huge gap between the public administration and the officials especially related to agriculture field, it may give good scope to the subject to examine and study the impact of globalization on agriculture. The technology, marketing, corruption and negligence for agricultural families in the government machinery are the main theme of this study. The globalization has caused severely for monitoring the corruption in administration. This research study is confined to the accessibility and accountability of government services towards agriculture in the form of giving suggestions to stop farmers' suicides.

These developments regarding agricultural field is very less/minimal even after 69 years of independence of India. The policies which are practicing today are only helpful for high class/big farmers. They are moving forward from village to taluka level to gain political support and avail the agricultural benefits which are announced by the central and state governments. The agricultural schemes which are introduced by the government are not transparent. Usually the farmers never show their interest or they have no time to get the official documents from various departments due to rigid official procedures.

The growing role of government as the partners with the promoters under the process of globalization is as read that "the role of governments progressively shifting towards providing an appropriate enabling environment for private enterprise" (UNCTAD- United Nation Conference on Trade and Development-1996). Here it seems to be the shift of welfare state into a corporate state or shadow state.

The Village Panchayats have been used as an instrument to implement government programs. But in reality we find that there is 'no farmer friendly' procedures due to shortage of agricultural related fund. In some programmes, the panchayat members are distributing the schemes to the beneficiaries after settlement of their share. Because of local politics PDOs (Panchayat Development Officers) are co-operating these members to implement these agricultural programmes on percentage basis. Recently it is witnessed that some officers committed suicide or resigned from their post. It is clearly indicates that the severity of corruption level in the grass root politics.

There is a tremendous progress in the field of science and technology that has made the life quite comfort. The freedom fighters had dreamed of a free India as "**Ram Rajya (ideal state) from colonial rule or by imperial clutches**". But soon after independence all moral and ethical values were thrown out to the dustbins. People in general and politicians in particular became selfish and self-centered. As a result, the agricultural sector lost its image gradually. Farmers have no choice but silently accepted all the dealings of the politicians with politicized administration. Even many of the farmers' families couldn't get proper compensations.

The mass media is strong pillar of democracy. And the success of democracy depends on free and frank media. But to create good public opinion over the matters of farmers' deaths some personal causes were highlighted colorfully by the Medias. No farmer is ready to die only for the sake of compensations. But the media has not shown any deep rooted causes for failure of agriculture crops and all that.

One important Table indicating the farmers' death or suicides issued by Ministry of Agriculture is mentioned below. Kindly note the figures provided in the Table.

# CRISIS AND COMPENSATION

Details of compensation given from 1 Apr to 29th Jul 2015

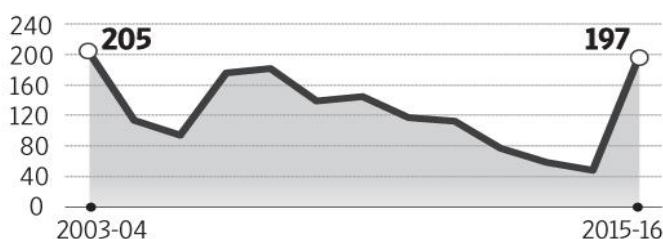
District	Total no. of suicides	No. of applications		Compensation given (no. of cases)	Release (₹ in lakhs)
		Accepted	Rejected		
Bengaluru	2		1	0	4
Bagalakote	4			0	6
Bellary	4	1	1	0	6
Belagavi	10	6		4	8
Bidar	6	5		0	12
Chamrajnagar	3	2		2	4
Chikkamagaluru	6	3	2	3	12
Chitradurga	5			0	8
Chikkaballapura	1			0	4
Davanagere	8	5		5	16
Darawada	11	3	1	3	12
D. Kannada	3		2	0	8
Gadag	6	4		4	12
Haveri	17	9	1	9	26
Hassan	11	3	3	3	10
Kalaburagi	6	3		3	12
Kolar	2	1		1	4
Koppala	4		2	0	6
Kodagu	2			0	4
Mandya	29	7	6	4	36
Mysuru	14	4	1	4	22
Ramnagara	9	3		2	12
Raichuru	8	3		3	16
Tumkuru	12	8		8	8
Yadgiri	3	2	1	2	8
Vijayapura	2	1		1	6
Udupi	2	1		1	4
U.Kannada	3	2	1	1	6
Shivamogga	4		1	0	4
<b>Total</b>	<b>197</b>	<b>76</b>	<b>23</b>	<b>63</b>	<b>296</b>

District-wise list of farmer suicides in Karnataka until 29 July 2015

Total number of suicides

Bagalkote	4
Bangalore rural	2
Belagavi	10
Bellary	4
Bidar	6
Chamrajnagar	3
Chikballapura	1
Chickmagalur	6
Chitradurga	5
Devanagere	8
Dharwad	11
Gadag	6
Hassan	11
Haveri	17
Kalaburagi	6
Kodagu	2
Kolar	2
Koppal	4
Mandya	29
Mysuru	14
Raichur	8
Ramanagara	9
Shimoga	4
Dakshina Kannada	3
Tumkur	12
Udupi	3
Uthara Kannada	2
Vijayapura	2
Yadagiri	3
<b>Total</b>	<b>197</b>

Year-wise list of farmer suicides



Source: Ministry of agriculture

## Conclusion

The Indian farmers are thirsty for political reform. They are not satisfied by a theory or model. Political reform must ideally come in the shape of legislations or the acts that may ease the farmer's problems. Conversion of the politicians into compassionate servants of the society is need of the hour. Public administration has failed to protect farmers' interest of all categories, the farmer's suicides are continued till today. The profit motiveness in all fields has increased, so rich and dominant class of society emerging continuously and they exploit the agricultural society. The corporate sectors and multi-national companies of the world are virtually controlling the GDP (Gross Domestic Product).

All are tax payers in democratic system but some category of the rich people of society are enjoying the life but some class of people like farmers are still struggling for their daily needs like

food, health, shelter and clothing. The public administration has to adopt non corrupt ways to ensure social security, justice in the society for safeguarding the interest of the agricultural families.

Reducing the cost of agriculture field is also need of the hour. Government has to install Bio-metric card system units in farmers land and identify the real farmer and who is eligible to avail all the benefits of the govt. Social security card, Health card, Soil card, minimum pension system who works hard to develop his agriculture is to be framed and executed.

Bureaucrats are said to be parents/guardians of the society. To reduce corruption in revenue and agricultural departments the farmers committee should be formed to look after the needs of the farmers and same is to be fulfilled without any hindrances. Even after induction of new technological services in agricultural sector majority of farmers are away from such knowledge or not trained them in proper way to handle the technological equipments. So government has to take measures, to develop awareness and establish mint of more training centres.

The elected politicians and paid public servants harbour great mistrust about the ordinary formers' capacity to decide what is best for them. Creating awareness among farmers and show how agricultural system is more beneficial to his family has to be major issue of the government.

#### **Suggestions:**

1. The proper approaching road facility should be provided through government projects. Still many farmers are struggling to bring out their products to the market due to no proper approaching roads.
2. Insurance facility should be provided in minimum cost for his life and his castles.
3. Compulsory visit of agriculture officer to farmers land in every season should be done compulsory. Failure of crop certain % of accountability system should be introduced.
4. Family members of farmers are to get agricultural related degrees, and then special reservation provision should be made in the agriculture and revenue department.
5. Introduction of incentive based allied agricultural programmes should be introduced like, Dairy, poultry farm, seed production, fisheries, growing medicinal plants, sericulture etc.
6. Introduction of need based and season based loan providing system should be introduced in transparent way. Money lending business has become one type of business for politically supported agents to earn illegal money and it should be monitored.
7. Moral and ethical training and orientation should be given to the farmers regularly.
8. The Government officials and NGO's should take initiatives to create awareness among the rural farmers and minimise their fear about marketing and use of technology.
9. The policies and programmes of agricultural, horticultural are to be conducted especially by the agricultural universities.
10. Political interference should be minimal in providing agricultural subsidy, free seeds and other benefits.
11. Many bills are passing in legislature without proper demand of people on considering the public opinion it is vanishing the interest of agricultural society.
12. And finally a very strict legislation on control over the corruption through public participation is desirable for discussion before flooring in the house.

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## Rural Development; Challenges And Issues In India

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*Rural development is one of the most important factors for the growth of the Indian economy. India is primarily an agriculture based country. Agriculture contributes nearly one-fifth of the gross domestic product in India. In order to increase the growth of agriculture, the government has planned several programmes pertaining rural development in India. Since Independence, India has made a significant progress in various sectors of rural development. Around 65 percent of the country's population is living in rural areas. People in rural areas do not have the same quality of life as enjoyed by the people living in suburban and urban areas. Hence, Rural Development, which is concerned with economic growth and social justice, improvement in the living standard of the rural people by providing adequate and quality social services and minimum basic needs, becomes essential.*

*The term rural development is becoming a buzz word all over the world. As most of the people on earth live in rural areas, development in true sense cannot be expected without addressing the basic necessities of this huge population. In the era of modern science and technology, large amount of population in rural areas are still deprived of adequate nutrition, good education, proper communication, and social justice.*

*However, till today, there is no universally acceptable definition of rural development. As a concept, rural development is comprehensive and multidimensional. fore, rural development is gaining importance in both the developed and developing countries.*

It means improving the quality of life of the people living in rural areas through agriculture and allied activities. As a phenomenon, rural development is the result of interactions between various physical, technological, economic, socio-cultural and institutional factors.

The present strategy of rural development mainly focuses on poverty alleviation, better livelihood opportunities, provision of basic amenities and infrastructure facilities through innovative programmes of wage and self-employment.

### **Meaning and definition of rural development:**

The concept of rural development is quite comprehensive and extensive. G. Shah defines rural development as “the development of rural areas, often rural development has meant the extension of irrigation facilities, expansion of electricity, improvement in the techniques of cultivation, construction of school building and provision of educational facilities, health care etc. This is considered to be a lop-sided view of understanding rural development. Of late, rural development signifies a complex and long term process involving fundamental transformation of rural society both at social and economic levels.

The term rural development combines two words 'Rural' and 'Development'. The term 'rural' essentially means an area, which is characterised as non-urban style of life. occupational structure and settlement pattern. Thus the term Rural Development is viewed as an activity of a serious activities or a process. Rural Development is the process of improving the quality of life and economic well-being of people living in rural areas, often relatively isolated and sparsely populated areas.

### **Objectives of the Study:**

1. To understand the concept of Rural Development.
2. To trace out the challenges of Rural Development.
3. To study essential aspects for Rural Development.

### **Methodology:**

The study is mainly based on secondary data and information collected from books, journals, articles, magazines and daily news papers etc.

### **Concept of Rural Development in India:**

The concept of rural development has changed significantly during the last three decades. Until the 1970s, rural development was synonymous with agricultural development and hence focused on increasing agricultural production. This focus seems to have been driven primarily by the interest of industrialization to extract surpluses from the agriculture sector to reinforce industrialization. In more recent years increased concerns on the environmental aspects of economic growth have also influenced the changes. Today's concept of rural development is fundamentally different from that used about three or four decades ago.

### **Importance of Rural Development in India:**

Rural development is a dynamic process which is mainly concerned with the rural areas. These include agriculture growth putting up of economic and social infrastructure, fair wages as also housing and house sites for the landless, village planning, public health, education, and functional literacy, communication etc. Rural development is a national necessity and has considerable importance in India.

Improvement in the quality of life of rural people is the important agenda of rural development programme in India- a country where the number of people living in rural areas. Rural Development implies both the economic betterment of people as well as greater social transformation. The basic objective of all rural development endeavours/ programmes has been the welfare of millions. In order to achieve this, planned attempts have been made to eliminate poverty ignorance and in equality of opportunities.

### **Essential aspects of Rural Development:** The essential aspects of rural development are as follows:

1. Agricultural development constitutes the crucial aspect of rural development. Agricultural development is possible through the use of better seeds, adequate fertilisers, manures, and pesticides, adequate supply of water and effective implementation of land reform measures.
2. The success of the rural development programmes depends on the co-operative orientation and attitude among the ruralises. The functioning of the co-operative societies goes a long way in improving the conditions of the vulnerable sections of the rural set-up.
3. Rural development programmes demand the active participation of the ruralises. While formulating these programmes the opinions, attitudes, drives and interests of the rural people should be taken into account.
4. By effecting changes in the socio-economic institutions, rural development seeks to change the socio-economic structure of the rural community.
5. The effectiveness of the rural development programmes necessitates political non-interference. The persons associated with these programmes should be given adequate freedom to carry out their plans and programmes with undivided attention.

### **Problems of Rural Development:** Some major problems are as follows:

#### 1. Poverty:

Poverty is considered to be one of the major hurdles in the path of development. Poverty refers to a level of living so low that it prevents normal development of human personality-physical, mental and social. According to Planning Commission, 21.1% people (estimated) in rural areas of our country were living Below the Poverty Line in 2007. There are different indicators of poverty which includes roads and communication facilities, primary schools, health care facilities, fair price shops, drinking water facility, electrification, marketing facilities etc.

#### 2. Illiteracy:

Education is the key to development. However, much have to be done to attain 100 per cent literacy. According to 2001 census, literacy rate in rural India is only 59.40 %. In line with the efforts of UN, there is a need to ensure that by 2015, all children must have to receive full primary education.

**3. Ignorance and Lack of Scientific Temperament:**

The issue related to lack of scientific temperament is closely associated with proper education. There is a need to make people aware about scientific phenomena behind health and sanitary problem and also to fight against all kinds of evils in the society.

**4. Exploitation by Vested Interest Groups:**

The very existence of old Jamindari system is though not available, rural people are still in the grip of money lenders, mahajans, middlemen and also local level politicians. Due to poverty, lack of education and some other socio-political issues, rural people are exploited by these groups.

**5. Ill-Health:**

Due to lack of proper health care facilities and education, people of the country are suffering from various diseases. Child mortality and greater number of maternal death are also creating major threats to development in the country.

**6. Communication and Transportation:**

Even after sixty two years of independence, the communication and transport system of the country are not up to the mark. However, these two are equally important to speed up agricultural development. The conditions of the rural as well as urban roads are also deplorable which are very important for movement and products of goods for marketing from rural to urban areas and vice versa.

**7. Small Landholdings:**

With the increase of population, the land, one of the major factors of production, is becoming a scarce commodity. As per National Sample Survey (2002-03), the average land holding in India was 1.06 ha only and marginal holdings (of size 1 hectare or less) in 2002-03 constituted 70% of all operational holdings. The experts are of the opinion that use of agricultural technology in small landholdings is very difficult. Therefore, need of the hour is to evolve modalities for development of appropriate technology suitable for small holdings.

**8. Malnutrition and Starvation:**

It is closely linked with the issue of extreme poverty as well as mass awareness. The infant mortality rate (under-1) was 54% in 2007. Moreover, in some areas of the country, due to several natural disasters, deaths out of starvation and malnutrition are still reported. Sometimes, due to lack knowledge of balanced diet, people suffer from various ailments

**Rural Development in India- Some Schemes**

For uplifting the rural sector of our country, the Ministry of Rural Development and Government of India in coordination with Department of Rural Development have been carrying forward various schemes. These schemes are formulated to benefits the citizens of rural India. The schemes are as follows.

1. Pradhan Mantri Gram Sadak Yojana (PMGSY): The main of the scheme is to connect all the habitations with more than 500 individuals residing there, in rural areas by the means pf weatherproof paved roads.
2. Sampoorna Gramin Rozgar Yojana (SGRY): This scheme aims at increasing the food protection by the means of wage employment in the rural areas which are affected by the calamities after the appraisal of the state government and appraisal is accepted by the Ministry of Agriculture.
3. Indira Awaas Yojana (rural Housing): This scheme puts emphasis on providing housing benefits all over the rural areas in the country.
4. Sarv Siksha Abhiyan: Pioneered by former Prime Minister Atal Bihari Vajpayee, the scheme was launched in 2000 to provide an opportunity to all children between 6 to 144 years of age to get free education which is a basic fundamental right.
5. Sansad Adarsh Gram Yojana (SAGY): is a rural development project launched in 2014 by Government of India in which each Member of Parliament will take the responsibility of three



villages and look after the personal, human, social environmental and economic development of the villages.

6. Antyodaya Anna Yojana (AAY): Launched in 2000 is aimed at providing food grains to around 2 crore people at subsidised rates. As per the scheme Below Poverty Line (BPL) families were provided 35 kgs of food grains.

7. National Social Assistance Programme: The scheme signifies the fulfilment of Directive Principles in Article 41 and 42 of the constitution which states that is the duty of the state to provide assistance to the citizens in terms of Sickness, unemployment, old age in limits of the economic capabilities.

### **Challenges of rural development:**

1. Developing rural areas is long time consuming process.
2. There is no doubt that, most of the rural people depend on agriculture and that is rising business.
3. Sustainable economic growth and diversification.
4. Government funding and institutional development.
5. Lack of appropriate technology and beneficiary participation
6. Agricultural employment has started to decline and where replacement employment is required.

### **Conclusion:**

Government at the centre and states must ensure the farmers and people of rural society for agricultural and rural development by extending and giving good implementation of the policies. Rural people must have the access to the basic life-sustaining articles, such as, food, shelter and clothing. It must be made available to the rural people. Besides, there must be provision for sound health care facilities and also social security. In absence of these, rural development can hardly be achieved. Rural development programmes demand the active participation of the ruralites. While formulating these programmes the opinions, attitudes, drives and interests of the rural people should be taken into account. Further, dedicated and committed village leaders should come forward to guide the masses for bringing about rural development.

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## Application of Geospatial Technologies to Assess Agriculture Suitability for Development Planning

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### Abstract:

*Rural development by promoting access to economic and social services and thereby generating increased agricultural income and productive employment opportunities. It is also key ingredient in ensuring poverty reduction. India is essentially a rural oriented economy with 74 % of its population living in villages. In this paper generate the application of geographic information system in road information system for the development planning of Medha circle in Satara district. Agriculture Suitability, an attempt has been made to integrate dimensions in agriculture, water, soil and climate continuum for sustainable management of land and water resources carefully for the regional development planning of any area.*

**Keywords:** Agriculture Suitability, Geospatial technologies,

### Introduction

In India, more than 70% of the population lives in rural area, so we need a very structured planning procedure should be used for the development activities and infrastructure facilities available in rural area. Planning requires association and integration of various activities with spatial and non-spatial characteristics. Geomatics based approaches to planning and management have of late gained prominence as they offer rational, efficient and effective solution. It also displays regions economic conditions and growth of the region. Geographic Information System is more helpful to management function in the planning process of the access agriculture potential area for the agriculture suitability. The purpose of this study is to demonstrate the importance of using Geographic Information System and Remote Sensing in supporting decisions for sustainable agricultural development. This is experimented within a rural setting where use of such technology is limited, despite having been used elsewhere in developed and developing nations.

### Geospatial Technologies and Agriculture Suitability

Sustainable agriculture and rural development practices have potential to reduce hunger and poverty while sustaining the ecosystems that poor rural people rely on for livelihoods. Because of lack of research, rural areas face challenges related to agricultural sustainability, natural resource management, business diversification, agriculture efficiency, and long term growth and planning. Sustainable agricultural productivity in the 70s was not a major issue as food resources did not appear to be threatened. The attention was on producing enough food to overcome the immediate problems of food deficit. However, the environmental effects of intensive agriculture, such as soil erosion, salinization, pollution of ground and surface water, and loss of biodiversity resulted due to land that was not utilized according to its sustainable potential that ultimately led to the concerns of sustainability of agricultural production challenges at global and national scale (FAO, 1995). Sustainable agriculture involves efficient and effective management of environmental, economic and social aspects. The challenge for agricultural research systems' management in the 21st century is to enable the transition to sustainable agricultural development through functional integration of the sustainability concept into agricultural research policies, programmes and projects.

### Study Area

The Jaoli tehsil in Satara district of Maharashtra lies between 17<sup>o</sup>, 57" and 17<sup>o</sup>, 25" north latitude to 73<sup>o</sup>, 32" and 73<sup>o</sup>, 57" east longitudes. In the Jaoli tehsil there are five circles and Medha circle is one of them. In the Medha circle observed that 4901 rural settlements and in that settlements 2855 joint and 2006 nuclear settlements. The total population of the Medha Circle is 23382 in 4901

houses. Following table shows that village wise rural settlements in Medha circle: The total area of the Medha Circle is 8989.57 hectares. The mean minimum temperature is 14.4° C and mean maximum temperature is 36.8° C in the Circle and average rainfall is about 1250 mm.

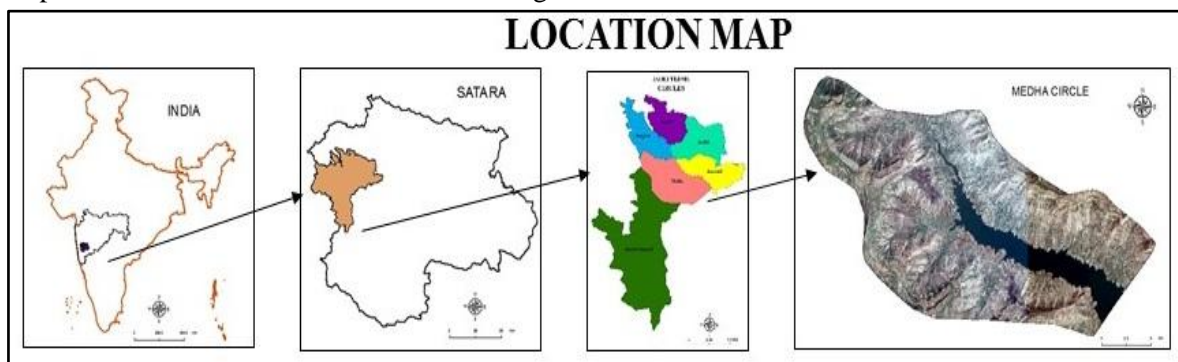


Figure- 1

### Geology and Relief

The physiography of Medha Circle is typical and interesting because the tehsil is located in mountain ranges and surrounding villages have hilltop and foothill locations. The circle and its surrounding area lie in the northern Sahyadri ranges, at the mean sea level varying from 600 to 1200 meter. Fissure volcanoes form these ranges, and the western part lies at the Kokan Sahyadri mountain ranges, which is part of Mahableshwar-Panchgani-Tapola-Vasota fort ranges. Venna River is the divider in the circle and it having various spurs and small valleys. A large area of hill ranges is under thick forest cover and this area presents the picture of intense erosion and ruggedness of landscape.

### Climate and Rainfall

The Jaoli tehsil and surrounding region experiences a monsoon type of climate, which plays a major role and influences on settlement and agriculture. The climate of tehsil is favorable and healthy. The average maximum temperature ranges from 30°c to 35°c and it is highest in month of April. The average minimum temperature ranges between 14°c to 18°c and it is minimum in the month of December and January up to 8°c to 10°c. The average rainfall is about 1250 mm and it is highest in the month of July and August.

### Drainage

The general slope of the ground of the Jaoli tehsil is found in the south-east and north-east direction, so the various streams flow from the north of the Mahableshwar and Panchgani plateau, which drains their water into Venna, Kudali and Koyana River. The Venna and Kudali are important tributaries of the Krishna which dominate the drainage system of the tehsil that passes in the northward direction intersected by various roads and passes, and through the east-west direction of the region. Medha circle is located in the Venna River valley on both the sides of Kanher Dam backwater.

### Soil

The soil in the Medha circle belongs to in the three main class viz. Reddish brown (Laterite soil), Medium Brown (Shallow Laterite) and Light Black Soil. This soil used for 'Kumri' cultivation or tillage on account of heavy rainfall. Laterite soils are subjected to heavy leaching and high degree of erosion. The reason for brown colour is high proportion of iron oxide in the soil.

### Database and Methodology

The methodology adopted for the development of road network is to maintain digital database using spatial and non-spatial data. Spatial data includes all the topographic and thematic maps. The Medha circle road map prepared from Survey of India toposheet (SOI) and satellite image and it provides information about the exact location of drainage network, and further it is updated with satellite data to know newly formed stream. In the present study survey of India (SOI) topographical map of 47G/13 and 47G/14 on 1:50,000 scale used for creation of base map.

### Software used

ArcGIS- 9.2, Global Mapper and ERDAS- 9.1 softwares are used in this work.

### Land Use/ Land Cover Medha Circle

The land use/land cover planning is very important for proper management and planning because it gives an idea of land use patterns and trends of change land resources. It provides information about the spatial distribution, location, types and coverage of land. The land use map gives information about the usage of land and the changes on the earth surface. The information on land use/land cover patterns, their spatial distribution and changes over a time scale are the pre-requisites of preparing development plans.

Land use planning forms an important core component in development programmes of hilly area for evolving effective plans at regional level. Hilly terrains offer a lot of challenges in land use planning due to their intricate bio-physical and socio-economic setup. Hence the integration of scientific input through advanced techniques required (R.K. Lallianthanga et al., 2014). The need of land use studies is much more essential in the areas where the kind and degree of land use form the crux of the real economy. Land is the most important natural resource because all human activities are based on it and the earth surface contains very few of land resources.

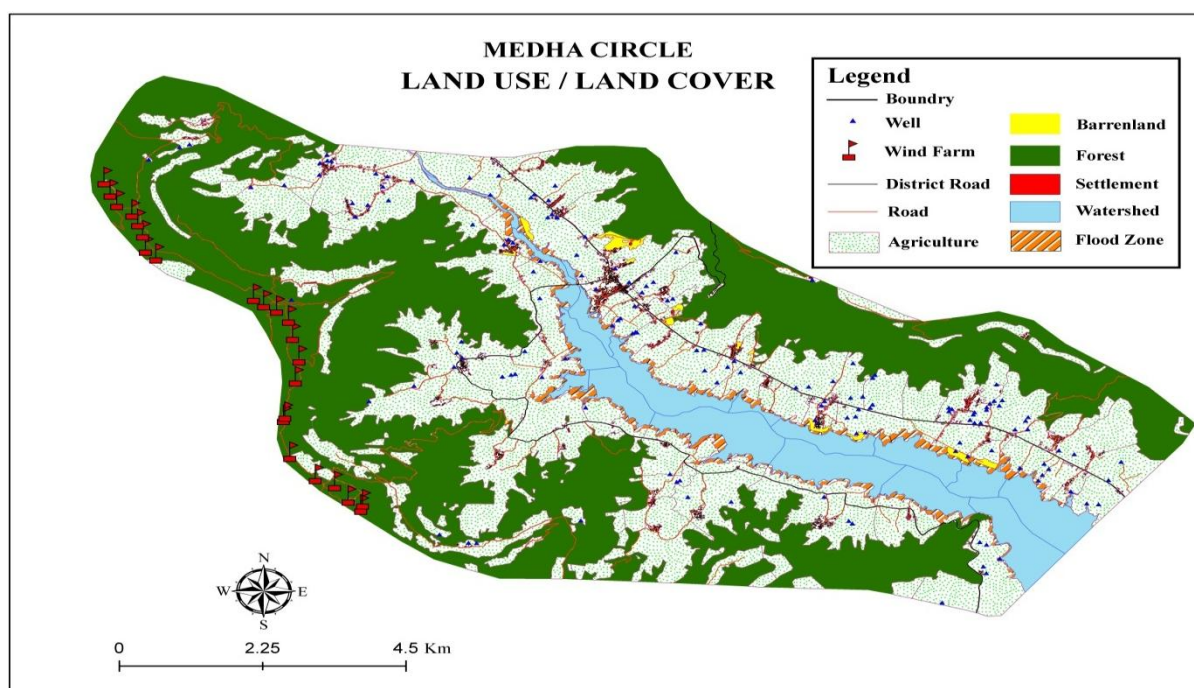


Figure- 2

There is a need of natural resource planning in the Medha circle because it needs to meet the growing demand of the ever increasing population. Consumption of food, fibre, fishery products, fodder, fruits, fuelwood and other materials has led to environmental degradation and rapid expansion of wasteland. It is here that adequate planning needs have been focused in the present research.

The total area of the Medha Circle is 8989.57 hectares from which the total forest area is 1552.00 hectares. The total cultivable area including goucher and groves is 6213.41 hectares. The total barren land is 223.02 hectares. The hilltop hamlets include highest area covered by forest and the adjoining areas are barren land. In such villages, the barren land forms a major part of the barren land because of the steep slope. Villagers use this area as the grazing field. This is the reason for larger number of cattle in the hilltop hamlets. The barren land is more in the villages where mountain slope is steep. The land on the deep steep cannot be used for agricultural purposes as the process of soil erosion becomes faster.

The land on the deep steeps of the mountain ranges can be utilised for horticultural purposes. There are provisions made by the government for horticulture cultivation. The government sponsors plants of mango, blue berry (*Jambhul*), amla, custard apple, and some medicinal plants such as Aloe



Vera. People are not that much aware of these government schemes. There is a need of wider advertisement of these schemes among the farmers so that many farmers owning the barren land would try to bring it under cultivation.

### **Agriculture Suitability**

This study uses geospatial technologies to assess the agricultural potential of the Medha Circle, a rural area in the Jaoli tehsil of Satara District. This approach entails assessing the suitability in terms of land/soil and climate, which are determinant factors for agricultural development. Various spatial analysis techniques were used to model and assign classes of suitability based on the most important and yield limiting parameters such as rainfall, temperature and soil characteristics. Results indicate that the area is potentially suitable to a variety of agricultural commodities suitable for cultivation. This is however considerate of environmental and climatic constraints such as the availability of water for irrigation, improvement of the state of the environment, prevention of soil degradation due to erosion and compaction, improvement of soil fertility by means of sound farming and management practices. These outputs are presented within a user friendly GIS platform for a better decision support to the development agencies and government. The results also help to provide inputs for assessing financial feasibility of farming projects. This study therefore emphasizes the importance of geospatial technologies in informing and promoting sustainable agricultural development.

Agriculture is the main occupation of the people of the Medha circle. They mostly depend on the agriculture. 67 percent population of the circle is involved in the agriculture sector and allied activities. Male migrate to some metropolitan cities in search of employment because they do not have cultivable land and or the size of cultivable land is too small to fulfil their family needs. Proper planning of the cultivable and non-cultivable but productive land is necessary control migration of men to the larger cities which shall ultimately lead to the sustainable agricultural development.

Medha Circle in the Rabi season, the cultivable land under crop reduces to 40 percent of the land under crops in the kharif season as the irrigation facilities are absent in the area. Traditional agricultural tools and techniques are still preferred in the villages in Medha circle due to small size of land holdings and ignorance about the advanced technology.

Suitability of agriculture land use is determined on the basis of the climate, soil, water resources, topography, and environmental components and the understanding of local biophysical factors and land capabilities of the circle. The land evaluation method is the systematic assessment of land potential to find out the most suitable area for cultivation. The agriculture land suitability planning is made to identify suitable land for agriculture uses with optimum utilization causing minimum impact on the environment. The high slope gradient (above 5m) land is suitable for forest and horticultural products. Moderate slope gradient land (0 to 5m) is suitable for terraced farming. The land near water sources is identified as suitable for agriculture.

Figure 1.2 shows the agriculture land suitability of the Medha circle. The purple belt in the following figure indicates the ideal land suitability for the agriculture in the Medha circle. This land was used for the agriculture purpose but now days it is observed as the wasteland or barren land as it is covered by the Kanher dam backwater on both the banks of the Venna River. It is the flood zone land which opens in the month of November onwards up to the beginning of the monsoon. This land is more suitable for the agriculture. Venna river backwater deposited soil is stored in the flood plain on the river bank. Backwater level decreases when discharged through the dam for the purpose of irrigation. This soil is more favourable for the farming and cultivation of the vegetables, beans, maize, wheat, groundnut, watermelons, muskmelons, etc.

Medha circle total agriculture suitability area find out the 35.49 hector. In that wasteland area is 7.78 hector. The wasteland means the land which is uninhibited and uncultivated and which is no longer serving any purpose or is left out of cultivation. This land can yet again come in use for cultivation purposes. Medha circle Venna river flood zone total area is 11.58 hectares which opens in

the month of November and remains open till May. It is richer and fertile for the cultivation of vegetables, bean, groundnut, and crops taken in the Rubi season.

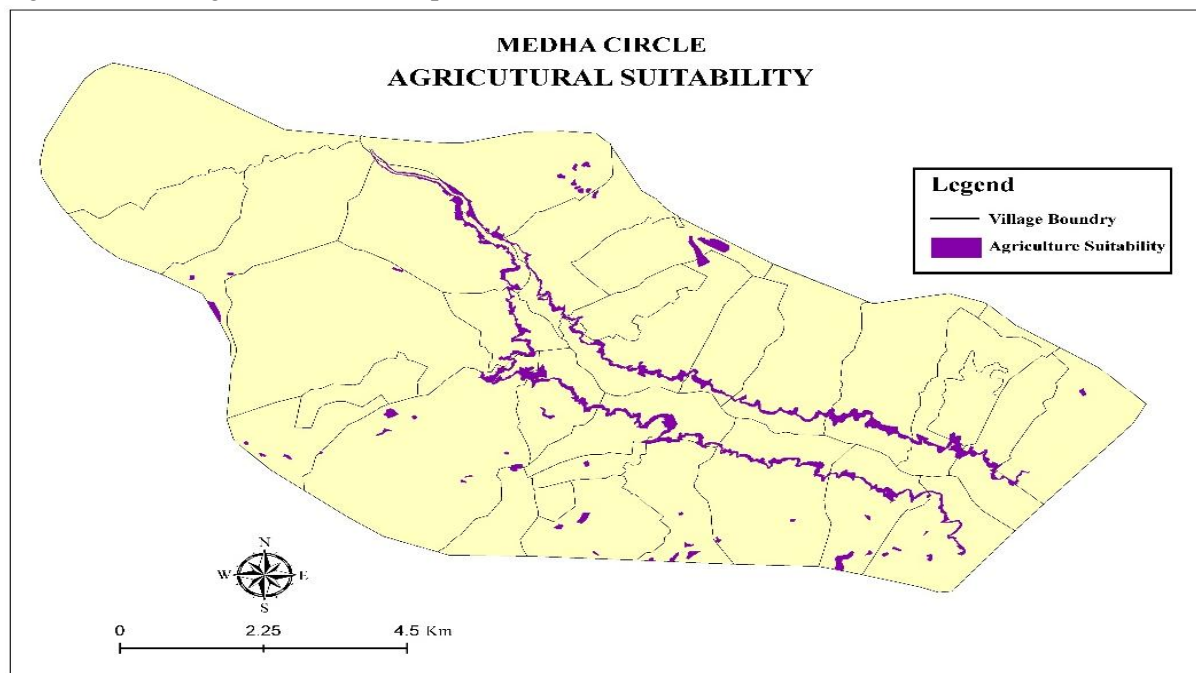


Figure-3

The land use planning in the hilly terrains is a challenging task as there are many biophysical and socio-economic factors. It is observed that there is good potential for horticulture and plantation on the deep slope unused land in the circle. The land use plan prepared in the study also focuses on conservation of the existing forests to maintain ecological balance apart from improved alternate farming practices. In the study area where the slope is from 0 to 5m, terraced farming is possible. Farmers owning the land can give it shape of terrace for farming purposes and grow regular crops. They can control soil erosion in the farm using stone walls. In the Kharif season they can direct water from streams to such farms so as to improve the quality of the crops taken. They can grow Strawberry if they can manage water flowing away through this slope. For this purpose they may opt for farm ponds. The stored water shall help them go for cash crops.

On the steep slope areas i.e. the slope of 5 to 10m, farmers can undertake horticulture plantation. They can dig ditches of adequate size so as to grow the fruit plants like mango, custard apple, blueberry, blackberry, jujube, jackfruit, and medicinal plants like Aloe Vera, amla, *ashwagandha*, *rita*, *shikakai*, *tulsi*, etc. Most of the medicinal plants are delicate and need special care by the farmer. However, the plantation on the wasteland, that too suitable to the qualities of the soil, would certainly increase their income. This shall encourage them to widen areas under plantation. They can avail financial assistance from the Agricultural Department from Jaoli tahsil.

### Conclusion

The proper planning and management of the wasteland and barren land shall ultimately control the flow of men migrating to the metropolitan cities. This will automatically strengthen family life of the people in the circle. In a way this will also stimulate the process of decentralization. Increased production of fruits may result in setting up of fruit processing units in the vicinity.

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## **Challenges And Approches Of Dairy Farming In Satara District (Maharashtra): A Geographical Analysis**

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### **Abstract:**

*In India, dairying is recognized as an instrument for social and economic development. The nation's milk supply comes from millions of small producers, dispersed throughout the rural areas. These farmers maintain an average herd of one or two milch animals, comprising cows and/or buffaloes. The animals' nutritional requirements are largely met by agricultural waste and byproducts (Gupta, 1987). Ample labour and a small land base encourage farmers to practice dairying as an occupation subsidiary to agriculture. While income from crop production is seasonal, dairying provides a stable, year-round income, which is an important economic incentive for the small farmer to take to dairying. Dairy farming is a very popular activity among the farmers in Satara district. It is carried out in the co-operative as well as private sector. As per the statistical data, Satara district is rich in animal population. The district has 730573 bovines, 637270 sheep and goats. In the present paper an attempt has been made to bring out the challenges and approaches of Dairy farming in Satara district. The study is based on Primary and secondary data.*

**Key words:** Animal husbandry, Co-Operative, Private sector, Dairy farming, Satara district,

### **Introduction:**

In India, dairying is recognized as an instrument for social and economic development. The nation's milk supply comes from millions of small producers, dispersed throughout the rural areas. These farmers maintain an average herd of one or two milch animals, comprising cows and/or buffaloes. The animals' nutritional requirements are largely met by agricultural waste and byproducts (Gupta, 1987). Ample labour and a small land base encourage farmers to practice dairying as an occupation subsidiary to agriculture. While income from crop production is seasonal, dairying provides a stable, year-round income, which is an important economic incentive for the small farmer to take to dairying. Dairy farming is a very popular activity among the farmers in Satara district. It is carried out in the co-operative as well as private sector. As per the statistical data, Satara district is rich in animal population. The district has 730573 bovines, 637270 sheep and goats. Animal husbandry and dairy development is second major sector which comes after Agri business Dairy farming is a very popular activity among the farmers in Satara district. It is carried out in the co-operative as well as private sector. As per the statistical data, Satara district is rich in animal population. The district has 730573 bovines, 637270 sheep and goats. Also 3979381 poultry birds are being reared by the farmers, employment to large number of people. The milk production of the district was 482.56 thousand mt. in 2001-12. About 51.23 percent of the milk produced is obtained from cross breed cows, 37.53 percent from buffaloes and 11.24 percent from indigenous cows. The major gap in milk production is low yield per animal, miss-management of dairy animal and low productivity of animal. It will be improved by developing exotic blood better training to the farmers about dairy management and importance. Satara district is well known for remarkable fish production also. Sheep and goat rearing activity is generally popular among families living below poverty line and with small/marginal farmers. Sheep rearing activity is more popular among traditional shepherds in the eastern part of district, while the goat rearing activity is more or less evenly spread all over the district. Although, a few piggery units have come up in the district, the activity is yet to gain popularity. Besides dairy, even poultry farming plays an important role and has high potential in the district.



In the present paper an attempt has been made to bring out the challenges and approaches of Dairy farming in Satara district. The study is based on Primary and secondary data.

### The Study Regions:

Satara district is the western part of Maharashtra State. Its location lies between 17° 5' to 18° 11' North latitudes and 73° 33' to 74° 54' east longitudes occupying an area of 10,492 sq. kms. Administratively, it consists of eleven tahsils (Fig.1) and the region presents diversified physiography with hilly region dominated by leeward slopes of Western Ghats in west and alternate valleys and ridges culminating gradually into plateau in the east. The soils vary from laterite patches in the west through deep medium block alluvial of the river in the center and poor gray soils in the east. The monsoon climate dominates the region with variation in heat and cold. The region receives rainfall from south west monsoon averaging between 200 mm to 5000 mm. The eastern part, which fairly falls in the rain shadow belt experiences frequent drought conditions.

## LOCATION MAP

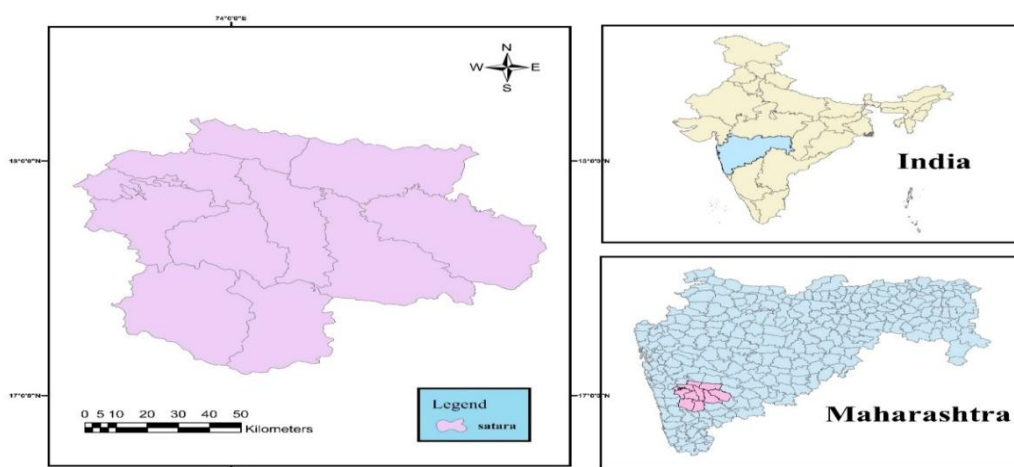


Fig.-1

### Objectives:

The major objectives of this paper are as under:

In the present paper an attempt has been made to bring out the challenges and approaches of Dairy farming in Satara district.

### Data Base And Methodolgy:

The present Study is based on Primary and secondary data. Primary data has been collected through the questionnaire and interviews of the selected Farmers. The Secondary data obtained from the records of Zilla Parishad and various records of Commissioner Animal Husbandry, Satara Agricultural Department of Maharashtra State. The values classified with the help of standard deviation Method.

### Analysis

Dairy is one of the most important allied activities carried out in Satara district. Though the activity has been spread over the entire district undoubtedly, the major challenge for the dairy sector in any developing nation is to increase milk production in order to meet the increasing demand resulting from the almost inevitable expansion of population and, presumably, growth of income. To meet this challenge, policies must become more market-oriented. The adoption of appropriate technologies for production, procurement, processing and marketing - after the unique environmental, social, economic, political and cultural environment of the individual country has been considered - is an important aspect of dairy development. Those national governments and international institutions

for whom the dairy sector is a major concern should accept the challenge and formulate policies that integrate and buttress the major functions of dairy development. Most of the significant developments in dairying in India have taken root in this century. The history of the dairy development can be broadly classified into two distinct phases: pre- and post-Operation Flood. On examining the developments made during both phases, it can be concluded that the difference lies in the basic approach to solving the problems facing the dairy sector.

Milk production in India is dominated by small and marginal landholding farmers and by landless labourers who, in aggregate, own about 70 percent of the national milch animal herd (Gupta, 1983). As crop production on 78 percent of the agricultural land still depends on rain, it is prone to both drought and floods, rendering agricultural income uncertain for most farmers. Shackled to subsistence production as a result of a shortage of finance and credit facilities, these farmers become entangled in a strangling debt cycle. The combination of an unfavourable land: person ratio and fragmented landholdings makes it difficult to support large families on crop income alone. It is not surprising that the small farmer and the landless labourer are more often than not victims of moneylenders (Zuvakis, 1979) and of natural calamities. Dairying, as a subsidiary source of income, is a real relief to most of these weaker groups in society. Often one or two milch animals enable these farmers to generate sufficient additional income to break the vicious subsistence agricultural-debt cycle.

The successful Indian dairy development programme Operation Flood has shown how food aid can be used as an investment in building the type of institutional infrastructure that can bring about national dairy development. Programmes like Operation Flood, with similar policy orientations, may prove to be appropriate to dairy development in other Asian as well as African countries since the conditions that prevail in dairying today in a number of developing countries are comparable to those that once were found in India. In the early 1950s, India was commercially importing around 55000 tonnes of milk powder annually to meet the urban milk demand. Currently, many developing countries either commercially import dairy products on a large scale or rely on donations to meet the gap between demand and supply of milk products. Together, developing-country imports account for over 70 percent of total world trade in milk products (FAO, 1993)

As in India, the reliance on low-cost and often-subsidized commercial imports as well as gifts seriously affects the development of dairying systems in many developing countries as they increase domestic demand for milk products and erode domestic-price incentives. As low-cost imports from advanced dairying nations depress domestic milk prices, it becomes uneconomical for local milk producers to invest in dairying, causing stagnation in production. This hampers breed improvement efforts, fodder production programmes, the manufacture of quality feed and other endeavours to improve productivity. For any country seriously interested in exploiting the potential of dairying, therefore, it becomes imperative to review and seriously consider policies that would promote dairy development activities by helping to establish independent and self-sustaining dairying systems.

**Table 1 : Tahsil-wise Livestock Population in Satara district:**

Sr. No	Tahsils	Area under fodder crops (ha)	Cattle (Nos)	Buffaloes (Nos)	Sheep (Nos)	Goats (Nos)	Total Livestock
1	Jaoli	1340	14058	11582	549	5356	31545
2	Karad	5105	44708	86674	15104	37692	184178
3	Khandala	2626	21561	8131	35422	16312	81426
4	Khataav	2363	43830	52734	25157	37714	159435
5	Koregaon	2425	38241	27669	15380	64838	146128
6	Mahablesh.r	2037	8242	4123	78	1495	13938

7	Man	3200	54508	37297	95705	79796	267306
8	Patan	12473	33644	54345	2259	26997	117245
9	Phaltan	7605	54880	23633	68935	57184	204632
10	Satara	3913	30822	39632	6134	20580	97168
11	Wai	1373	22863	17527	9579	15509	65478
	Total	44460	367357	363347	274302	363473	1368479

**Source: District Dy. Commissioner Animal Husbandry, Satara.**

### Sheep, Goat and Piggery Development:

Sheep and Goat rearing is a traditional activity in Satara district, carried out mainly by small and marginal farmers and landless laborers. Due to semi-arid and dry climatic conditions, the activity is concentrated in Khandala, Khatav, Phaltan and Man Tahsils. There is also concentration of shepherd population in these blocks. The activity generates additional income for the farmers. The population of Sheep, Goats and Pigs in the district, as per the Livestock Census 2012 (Provisional), was 2.74 lakh, 3.63 lakh and 11,048 respectively. Total production of wool in the district was 185.72 mt in 2005-09. The Maharashtra Sheep and Goat Development Corporation have its office at Dhivehi, which provides quality animals and technical guidance. The sheep breeding centre at Dhivehi supplies crossbred/ improved rams to the beneficiaries. There are 12 authorized slaughter 117 houses in the district. Markets dealing in livestock are organized at ten places in the district, at regular intervals, once a week on different days. The headquarters of Nimbkar Agriculture Research Institute (NARI) is also located at Phaltan. The institute is working for popularizing Sheep and Goat rearing through research and other activities.

### Strategy to Improve the Production: □

Organize the training program for farmers to educate nutritional management, quality milk production, care and management of breeding bull, milking cow etc. Encourage the farmers for organic and healthy milk production. Innovative dairy activities like establishment of breeding farms, automatic community milking centers etc. should also be encouraged and linked to bank finance. Dairy farming through tie-up with co-operative need to expand with corporate and private dairies. Organize the educational and training programmes for the farmers to identify and control of different poultry diseases. Bank can play a vital role by providing credit to the veterinary graduates for setting up of Agricultural clinic and Agricultural business centers. □ Rearing of crossbred female calves in co-ordination with milk unions and Animal Husbandry Department may be taken up as an economic activity under various poverty alleviation programmes. The availability of veterinary centers providing health care and AI facilities is inadequate. Veterinary graduates may be encouraged to set up health care units under ACABC scheme. Encourage the farmer for preparation of own quality poultry feed to minimize the production cost. Banks should encourage disbursement of poultry loans for broiler farming through contract farming. Similarly allied activities like setting up feed plants, livestock health care services, infrastructure development, retail marketing outlet for broiler marketing etc. should also be vigorously financed. Agriculture science graduates should be encouraged to set up enterprises, especially for providing veterinary and other support services. Effort should also be made to popularize goat/sheep farming enterprise among the women self-help groups.

### Conclusion:

Dairy is one of the most important allied activities carried out in Satara district. Though the activity has been spread over the entire district. Undoubtedly, the major challenge for the dairy sector in any developing nation is to increase milk production in order to meet the increasing demand resulting from the almost inevitable expansion of population and, presumably, growth of income. To meet this challenge, policies must become more market-oriented. The adoption of appropriate technologies for production, procurement, processing and marketing - after the unique environmental,

social, economic, political and cultural environment of the individual country has been considered - is an important aspect of dairy development. Those national governments and international institutions for whom the dairy sector is a major concern should accept the challenge and formulate policies that integrate and buttress the major functions of dairy development. Most of the significant developments in dairying in India have taken root in this century. The history of the dairy development can be broadly classified into two distinct phases: pre- and post-Operation Flood. On examining the developments made during both phases, it can be concluded that the difference lies in the basic approach to solving the problems facing the dairy sector.

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## To Study the Service Qualities in Indian Banks

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### Abstract

*Indian banking industry has started witnessing cut-throat competition in recent years. The litmus test for Indian banking industry is the way in which it faces the heat of intense competition and sustained global recessionary trends. The best way under the prevailing situation is to keep the customer's faith intact through rendering quality services without bothering too much about the profit. Service quality, in fact, is dependent upon the service performance and how far it is able to satisfy customers. The present study intends to study service quality as prevailing in different categories of Indian banks. There exists difference in the perception and expectations of customers of all categories of banks on majority of the dimensions of service quality. Relatively speaking, Public Sector/ Nationalised Banks have been found to be performing much better on reliability and assurance front while Private and foreign banks have been enjoying a definite edge on the way they tangibilise the intangible banking services through creation of appropriate physical evidence. There is definitely a scope for delighting and enhancing the loyalty of the customers by improving upon service quality being rendered to them. This is true in case of all categories of banks. The banks may start paying greater attention to service quality hither-to-be. This is the way to fae any sort of challenge ranging from cut-throat competition to global recession. Technicalities involved in understanding of the concept of service quality might have acted as a handicap for the customers in giving prompt and accurate answers to the questions in hand.*

**Keywords:** Service Quality, Reliability, Assurance, Tangibles, Empathy, Responsiveness.

### Introduction

Indian banking industry prior to the nationalisation of banks was a patchy one. It was characterized by unequal regional distribution, lack of people's faith in the same and absence of serious regulations. All this was instrumental in a situation that forced people to remain in the shackles of cruel moneylenders and private bankers. Nationalisation of banks initially paved the way for enhancing people's confidence in banking. Needless to say, after nationalisation, there was a mind-boggling increase in bank deposits and income etc. If nationalisation of banks was instrumental in establishing the true base of banking in India, LPG initiated in early 90s made the banks customer focused on account of intensified competition. The competition in Indian banking industry, as a matter of fact, is fiercer owing to the presence of public sector, private sector and foreign banks. This situation coupled with recent global recessionary trends has forced banks to encourage customers by adopting different and innovative policies. Service Quality has emerged as one of the most important issues in Indian banking sector. Any bank faltering on this front is likely to die prematurely. The banks, on the other hand, imparting quality in their services are likely to outshine over others. Service Quality has become the basic mantra not only for the survival but for growth as well. Quality of service depends on the service framework, which ultimately depends on service design. Service performance and customer satisfaction on which quality of service is measured is very much influenced by service design and service settings. The designing of service, thus, must be done carefully.

### Objectives Of The Study

The main objectives of the study as follows:

- To study the expectations of customers of commercial banks on service quality front.
- To study the service qualities in Indian Banks

### Research Methodology

This is an empirical study based on secondary data. The secondary data incorporated in the research is the outcome of literature on service quality scanned by the researchers from various published and unpublished report, journals, books and various websites etc.



### **Service Quality Analysis:**

#### **Service Bonding:**

Service bonding is the outcome of reliable services. It occurs when the company fulfills its promises made for the services. When any company keeps its promises made to the customers, they also give privilege to it by becoming loyal to the same. Hence, a sort of bond is established between the company and the customers. Reliability and hence service quality, are thus the pillars to any service quality pursuit.

#### **Service Accessibility:**

The ease with which customers can approach service provider is an integral part of service quality. In banking sector, proximity to bank branch, facilities such as e-banking and m-banking etc. goes a long way in getting positive perception of customers on service quality front.

#### **Service Accuracy:**

Errors in services, on account of their unique characteristics viz. intangibility, inseparability, perishability and inconsistency are very difficult to be controlled completely. However, all possible efforts should be made to keep these minimum possible to gain privilege of the customers. Accurate services, undoubtedly, may prove to be a real asset to any organization especially the one operating in service sector.

#### **Service Timeliness:**

Time scarcity always haunts modern day customers. Under such a situation, it becomes imperative for service providers to serve them within no time. Any organization that makes its customers wait generates a lot of ill-will for itself in their mind.

#### **Service Security:**

Safety and security of money perhaps matter most to the banking customers. Any doubt, what so ever, in the minds of the customers in this regard may spell doom for the bank. Merely claiming security is not enough. The real impression is created from the deeds in this regard.

#### **Service Impressiveness:**

Serving customers will satisfy them but serving them impressively will delight them. The behavior of the employees should be such that the same instills confidence in customers. There is no denying the fact that serving customers with a smile on the face may enhance the perceived quality of the service.

#### **Service Competence**

Ensuring service quality without competent employees is a distant dream. It is thus imperative for any service organization to judge the incumbent for competency before selecting and giving them continuous doze of training subsequently. This will not only enhance their skill set but also keep their customers happy and satisfied.

#### **Service Physical Evidence:**

Physical evidence (interiors and exteriors, quality of brochures, furnishings etc.), many a times is considered secondary to most other dimensions of service quality, yet it has its role to play in enhancing service quality.

#### **Service Customization:**

Each and every individual is unique and hence wants to be served differently. The present era calls for understanding unique needs of customers and satisfying the same in a unique way. Mass marketing has paved the way for customized marketing.

#### **Service Promptness:**

The swiftness, with which the front line managers respond to the service needs of customers, has a definite bearing on the way customers rate service quality. Promptness thus is an integral part of service quality.



### Conclusion:

There exists difference in the perception and expectations of customers of all categories of banks on majority of the dimensions of service quality. Relatively speaking, Public Sector/ Nationalised Banks have been found to be performing much better on reliability and assurance front while Private and foreign banks have been enjoying a definite edge on the way they tangibilise the intangible banking services through creation of appropriate physical evidence. There is definitely a scope for delighting and enhancing the loyalty of the customers by improving upon service quality being rendered to them. This is true in case of all categories of banks. The banks may start paying greater attention to service quality hither-to-be. This is the way to face any sort of challenge ranging from cut-throat competition to global recession. Technicalities involved in understanding of the concept of service quality might have acted as a handicap for the customers in giving prompt and accurate answers to the questions in hand.

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## The Geographical Study of Sacred Grove in Bhudargad Tehsil of Kolhapur District

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### Introduction:

Sacred does means the holy person, place or thing having blessed by Gods, whereas, grove is a conglomeration of different species of plants incorporating trees, shrubs and grass. It is also called as an orchard or wood. Simply sacred grove does means forest of God or Goddess therefore any untoward activity like cutting of woods, Killing any animal or living creature in sacred forest is strictly prohibited.

The significance of sacred groves has been convinced by many scholars in various streams of life science and geography. The western ghats being the biodiversity hot spot of the world offer several sacred groves. The Kolhapur district has about 225 sacred groves which are acting as gene banks. It is well felt fact that there are various factors affecting positively as well as negatively on conservation of sacred groves. The Bhudargad tehsil is comes into western ghat consequently number of sacred grove are located into the tehsil with variety of natural vegetation

### Objectives:

1. To study of the mythological / Historical background of the sacred groves in the study region.
2. To study of the flora and fauna of the sacred groves in the study region.
3. To examine the present status of the sacred groves in the study region.

### Study Area:

The Bhudargad tehsil is selected for the present study and which is located into the southern part of the Maharashtra. The Bhudargad tehsil is lays between 16° 07' to 16° 23' north latitude and 73° 02' to 74° 04' east longitude. The study region covers a total area about 547.51 Sq.km. The tehsil has covered 36.91 percent under the forest and the height of the study area is 563 meter. The annual rainfall of the tehsil is 1307 mm.

### Database and Methodology:

The whole data of the present study have collected through intensive field work and field survey. Interview of the local people had conducted to clarify the principal motive of the sacred grove. Secondary data also collected from the books, journals and newspapers.

### Mythological And Historical Importance For The Sacred Groves In Bhudargad Tehsil:

#### Bhujai (Tikkewadi)

The sacred grove of Bhajui comes under tehsil Bhudargad, is located on 10 km from Kolhapur-Gargoti road. It is approximately on 65km from Kolhapur city and situated on the plateau of height 784m. The sacred grove of Bhujai is abundant with various types of medicinal plants, animals, etc. According to the myth, a demon used to inhabit the place. He always used to trouble the people. Then the Goddess Bhujai appeared to salve the people from suffering. She slaughtered the demon and put an end to the people's hardship. Then she started living in the surrounding forest area of the village. Since then it is believed the place became her dwelling place. The local people worship the Goddess and have tremendous faith in her. Even people from Mumbai also come to visit the place, to get the blessings of the Goddess and to vow.

Another legend related to the sacred grove and the Goddess is equally famous. There is a dagger. Every three years, the dagger decides whether the people will stay and live in the village or outside the village. It is believed that Goddess expresses her wish through that dagger. (A custom of taking a verdict, Kaul Lawane) is very common in Maharashtrian religious culture. According to that

custom any object is used to understand the wish of the God such as rice, a coin, in this case a dagger. It is believed that the thing which is used to understand the God's wish is stuck to the God's forehead or to nearing object. If that object falls down it is believed that the wish is granted by the God and he has expressed his approval and if the object remain in stuck position and if does not fall, it is taken as disapproval for the specific thing by the God). According to her wish, people have to leave the village and have to stay and live outside the village and only can enter it if Goddess wishes to do them so.

The sacred grove is spread in the area of six acres and is under the claim of Tikkewadi village council. The idol of the Goddess is approximately of three feet. The women are not allowed to enter into the sanctum of the temple

### **Sonanakari (Shivdav) :**

The sacred grove of Sonanakari is located approximately on 100km from Kolhapur city. The forest of Patgaon in Tehsil Bhudergad is highly prosperous. The sacred grove is situated in the same area. As the temple is situated amongst the dense forest it is really hard to locate the temple. The grove area is highly compact and dark. Many rare medicinal plants can be found in this region. As the region is of dense forest, different types of animals and birds also can be seen. The villagers of Shivdav are considerably modernized even though they make use of these medicinal plants and carefully preserve them too.

A road passes through village Shivdav and to the right side of it Wanyachi Wadi is found. From it onwards, on 3to4km Harijan wada is situated. The grove of Sonanak is situated exactly opposite to the Harijan wada. It is said that the person named 'Sonanak' came to Harijan wada centuries ago and settled the habitation in the area. It is further said that the person came from the place called 'Natali' which is situated in Konkan region near Sawantwadi so it is believed that his origin belongs to that particular place. He came to the Harijan Wada approximately in 15<sup>th</sup> century. Afterwards, in the period of Chh. Shivaji i.e. in the period of 16<sup>th</sup> -17<sup>th</sup> century, Dadu and Vidhu Kamble, two noticeable men were known who belonged to the same family. After that, the descendant of the family settled here forever. Today, the place accommodates nearly 20-25 houses.

The dwellers of the Harijan wada now carry responsibility of the sacred grove. In the grove, two 'Basake' rocks (Basak is a symbol of God) and a place of Goddess Dirbha can be seen. A plinth (Chuthara) is also seen in the temple. The two different rocks are believed to be the dwelling places of God Virbhadra. Every year on the various occasions and festivals like Holi, Mahashivratri and Dipawali, the naivaidya (food offered as a prasada) is offered to all the Gods except the first symbol of the God. .

### **Bhutoba- Akurade :**

The village Akurade can be located in the South of Kolhapur city on 60km. It is on 3 to 4 km from the village a sacred grove of Bhutoba can be found situated on a hill. The sacred grove is covered with dense forest. The place is on 754 m from sea level. The village is developed one and the villagers have conserved the grove too. The sacred grove of Bhutoba occupies a complete hill covering a land of 200 to 250 acres. People from surrounding six villages always visit this place. Presently the vegetation in this grove is decreasing.

The sacred grove of Bhutoba is an ancient one. Every Sunday people come to visit the temple and thus on every Sunday the area can be seen crowded like it is during the pilgrimage. The scapegoat is always offered here. At least a single scapegoat is offered on every Sunday. The whole village comes to visit the temple on Sunday. Number of honey comb can be seen on many trees in this area of temple. These honey combs are always found there. It is believed that, if something goes wrong about some ritual or custom the honey bees leave their combs and people eventually understand that they have attempted some mistake. A nest of an owl can be seen on the tree of Helwa. An owl's existence also can be seen always over there. If some mistake is done while performing a pooja; an owl also leaves his place.

On every Sunday Gurav people perform a pooja. Devotees, according to their own wish offer a scapegoat or a cock. Besides, married new mothers are supposed to offer a scapegoat or a cock, it is a custom here. According to folk, it is believed that if a blood is shown to God then only he will keep them in good situation.

Lakhs or more devotees or people visit the place throughout the year. People from surrounding five villages regularly visit the temple on Sundays. According to the people, the God is alive. The temple is accredited with 'C' grade. The political leader, Chandrakant Dada Patil took efforts for it.

**Flora:**

**Plants Name Of Bhudargadh Tehsil**

Sr No.	Locale Name of the Plants	Scientific Name of the Plants
1	Hela	Terminalia belerica
2	Amba	Mangifera indica (Anacardiaceae)
3	Karanji	Pongamia glabra
4	Nilgiri	Eucalyptus (Myrtaceae)
5	Babul	Acacia Arabica
6	Vad	Ficus benghalensis (Moraceae)
7	Indian noni	Morinda Citrifolia (Rubiaceae)
8	Saptrangi	Hibiscus Cannabinus (Manvaceae)
9	Phanas	Artocarpus inteqqrifolia
10	Hirada	Terminalia chebula
11	Bambu	Bambusa dendrocalmus
12	Anjani	Memecyclon edule
13	Pimparni	Ficus tsiela
14	Palas	Beutea frondosa
15	Shissam	Dalberqia Latifolia
16	Nana	Legerstyroemia lanceolata

**Source: Based on fieldwork (Dec. 2014).**

Bhudargad tehsil also included in to the western ghat and which is in the sixth rank in the rainfall of the district which is (1307mm). In the whole tehsil's sacred groves found Hela, Amba, Karanji, Nilgiri, Bhabhul, Vad, Indian noni, Saptrangi, Phanas, Hirada, Bambu, Anjani, Pimparni , Palas, Shisav, Nana, Mohagani, Dhaiti, Katesavar, Bahava, Bhehada, Sagavan, Waivarna, Nilgiri this types of trees.

. In the Akkurde sacred grove Murudsheng, Hirada, Behada, Tamalpatri, Narkya etc medicinal plants generally found. In the Tikkewadi sacred grove Katesavar, Chitrak, Dagadful, Ambada, Behada etc plants are found etc plants observed. In the Shivdav sacred grove Saptrangi, Shatavari, Tamalpatri, Ranpangara etc plants mostly observed.

**Medicinal Plants Of Bhudargadh Tehsil**

Sr No.	Locale Name of the Plants	Scientific Name of the Plants
1	Hirada	Terminalia chebula
2	Murudsheng	Helicteres isora (Malvaceae/sterculiaceae)
3	Bhehada	Terminalia belerica
4	Dagadful	Parmalia ceperta

5	Kunkuphal	Mallotus – Philippinesis
6	Pinpal	icus religiosa (Moraceae)
7	Khair	Acacia catecha
8	Bhava	Cassia fistula L. (Caesalpinaceae)
9	Ukshi	Calycopteris floribunda
11	Shatavari	Asparagus racemosus (Liliaceae)
12	Ambada	Spondias lulkis (Anacardiaceae)
13	Amruta	Tinaspara Cordifolia (Menispermaceae)
14	Chitrak	Plumbago zeylanica

**Source: Based on fieldwork (Dec. 2014)**

#### **Fauna:**

The Bhudargad tehsil also a part of the Western Ghats where the various rare animals are habitat. In the Bhudargad tehsil sacred grove Kolha, Gavireda, Randukkar, Sambar, Harin, Bhekar, Haraltol, Sap, Sasa, Beduk, Sarade, Mungus, Ghorpad etc animals are found and Mor, Khandya, Kavala, Kokil, Popat, Chimani, Hola, Garud, Satbhai, Ghubad, Vatwaghul, Bhekar, Bhardwaj, Ghar, Fulphakhare ect birds also found.

In Shivdav sacred grove Popat-2, Mungus -2, Sarade-2 observed. In Akurde sacred grove Ghar-1, Sap-1, Gavarade-5, etc observed. In Bhujai sacred grove Kavala-5, Kokil-2, Chimanya-5 Ghubad-1, Bhardwaj-1, Fulphakhare-8 etc observed..

#### **Present Status :**

**Bhujai (Tikkewadi)**- The forest under the sacred grove area is decaying. Previously the forest used to be dense and it was not possible to carry the four wheelers to the temple because of absence of proper roads. Now the tar roads are made. The roads are made around the temple also. A shade is built under which Prasad (meal) is prepared; water is supplied through the tap. Earlier the temple was simple and small but now it is developed into a grand temple. No one follows the ritual of Navaratan as it should be followed in strict ways only by eating dried dates for nine days.

Some rare trees are vanished now and thus villagers have planted Australian acacia and Nilgiri trees. The trees have grown up now nicely. Every single person of the village contributes in the preservation of the sacred grove of Bhujai. The young generation wishes the place to become a tourist centre as many people from outside the village and from distant region come to visit the Goddess and the place with religious attitude.

**Sonanakrai (Shivdav)** -The noteworthy thing about the sacred grove is that the place has got its name from a person of a harijan community named Sonanak. He is believed to be the person who settled a human habitation in that place. So, the members of Harijan community only carry all the responsibilities and management regarding the temple and the grove. Today also, in the world of modernism, the villagers make use of medicinal plant. Without seeking the permission from the God in the form of verdict, villagers do not dare to do any important work. Thus, it can be surely said that the vaidyas of the village have preserved the place. The two people Dadu and Vithu Kamble developed and maintained the grove from the period of Chh. Shivaji. The ancestors of Kamble family brought medicinal plants and planted in the grove and preserved them too and thus today's generation can enjoy its goodness.

Presently, the sacred grove is covered with dense vegetation. The villagers today also take care of the grove with the same feelings and passion. They believe in the God. Today also they ask for verdict from the God for any important work. The people heartily bless that the grove would remain as it is forever. No one cuts the wood or tree here as they believe the God is present in each tree.

**Bhutoba, (Akurade)**- The percentage of vegetation in the area of sacred grove of Bhutoba is decreasing. Thus villagers have developed a nursery by planting many trees of nilgiri. The young generation understands the importance of the sacred grove and thus participate actively in the

conservation. The temple of Bhutoba is also being developed now. New construction is going on. To cook the naivaidya, a shed is also built. This is, the temple is visited by all people of the village on every Sunday.

**Conclusion :**

The Bhudargad tehsil is comes into western ghat consequently number of sacred grove are located into the tehsil with variety of natural vegetation. In the Bhudargad tehsil some sacred grove are disturbing by the human interference therefore various rare plants are decreasing . There is found also deforestation by local people and which is affecting on the density of flora and founa of the tehsil so it's proper management is essential need in the present day. The more attention of the forest department can be improve the stutus of the sacred grove of the Bhudargad tehsil.

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## Comparative Analysis of Inter-Changing Proportion of Cultivators & Agricultural Labourers in Chiplun Tehsil: A Case Study of Six Selected Villages

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### Abstract

Around 61.5 % population of India is engaged in the agricultural field, according to the 2011 census. It is observed that, like India, the proportion of cultivators have been decreased by 28.54% & the proportion of agricultural laborers have been increased by 122.88% during the 2001-2011 decade in Chiplun Tehsil. Hence, the main aim of the present research paper is to analyze the inter-changing proportion of cultivators & agricultural laborers in North-Eastern Chiplun Tehsil. The research paper is based on primary as well as secondary data. The collected datasets have been analyzed using SPSS software. The study reveals that the cultivators and agricultural laborers have a negative correlation. Increase in agricultural laborers is caused because of a decrease in cultivators. The decrease in cultivators is a result of increasing fallow land; climatic and market uncertainty; decreasing proportion of land giving others for cultivation; higher agricultural production cost and lower prices of agro-products; government policies.

### Introduction

Around 61.5% population of India is engaged in the agricultural field, according to the 2011 census. During the period of 2001-2011, the cultivators have decreased by 7.5% & contrary to it the agricultural laborers have increased by 3.5%, at the national level. Maharashtra in general and Konkan region, in particular, faces the problem of decreasing cultivators and increasing laborers. It is observed that in Chiplun Tehsil proportion of cultivators have been decreased by 28.54% & the proportion of agricultural laborers have been increased by 122.88% during the 2001-2011 decade. In the research paper, an attempt has been made to analyze the changing proportion of cultivators & agricultural laborers in North-Eastern Chiplun Tehsil.

**Study Region:** For the present research work six villages, namely Adare, Dhamanvane, Khandat, Kamathe Khurd, Nandivase and Kalkavane from Chiplun tehsil have been selected as a study region. Latitudinal and longitudinal extent of the study region is 17° 26' 24.15" north to 17° 34' 30.53" north and 73° 30' 06.68" east to 73° 44' 47.03" east respectively. An elevation of the study region from MSL is between 196 meter and 902 meters. Fig. 1 gives an idea of the location of the study region.

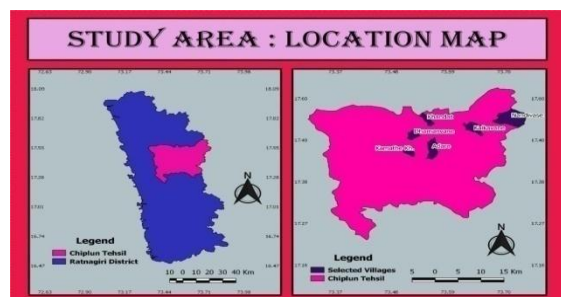


Fig.1

### Aims and Objectives:

The main aim of the present research paper is to analyze the inter-changing proportion of cultivators & agricultural laborers in North-Eastern Chiplun Tehsil. However, the specific objectives are as given below.

1. To find out bases of the inter-changing proportion of cultivators & agricultural laborers in the study region.
2. To analyze the changing occupational structure and land holdings in the study region.

### **Brief Review of Research work related to the topic:**

Plenty of researchers have addressed the problems of farming and farmers. But very few researchers have attempted to analyze the inter-changing proportion of cultivators & agricultural laborers.

Nitin Gupta (2016) elaborated about the Decline of Cultivators and Growth of Agricultural Labourers in India from 2001 to 2011. He deliberated the pattern of growth of cultivators and agricultural laborers for the states having a population of more than 25 million as per Census 2011. He found some reasons behind this condition - decreasing average size of operational holdings, farming becoming infeasible, increasing agricultural wages, rampant selling of agricultural land and shift of employment from the agricultural to non-agricultural sector.

Shivarag, Sagar (2017) studied the problems of agriculture laborers, Government policy measures and gave a suggestion for improvement of the agricultural labor conditions. Som, Ranjan Kumar (1961) tried to study the agricultural laborers in India. Malathesha, D.B. & Rangappa K.B (2018) has studied the trends agricultural laborers in Karnataka State with the help of Census data from 1961 to 2011. S. Subramanian (2015) studied the emerging trends & patterns of India's Agricultural workforce with the help of census data from 1981 to 2011.

### **Research Gaps:**

Followings are the major research gaps identified by the researchers related to the topic.

1. Very few researchers have addressed the causes of decreasing cultivators and increasing agricultural laborers at the micro level.
2. No one from the Konkan region in general and Chiplun tehsil, in particular, attempted the issue.

### **Research Methodology**

#### **Methods of Data Collection:**

The present research work is based on the primary as well as secondary data. But primary data is the main source to meet the objectives of the present research work. Hence, the primary data is collected with the help of a schedule. An interview technique & observation method is used as support to the questionnaire. The randomSampling method is used for the selection of households as a respondent from the six selected villages. Total 208 households have been interviewed with the help of schedule and it is the 10% household samples were taken. 208 total questionnaires were filled. Besides primary data, secondary data has been collected from various websites, Government reports, books, journals, etc. which have been explained under references.

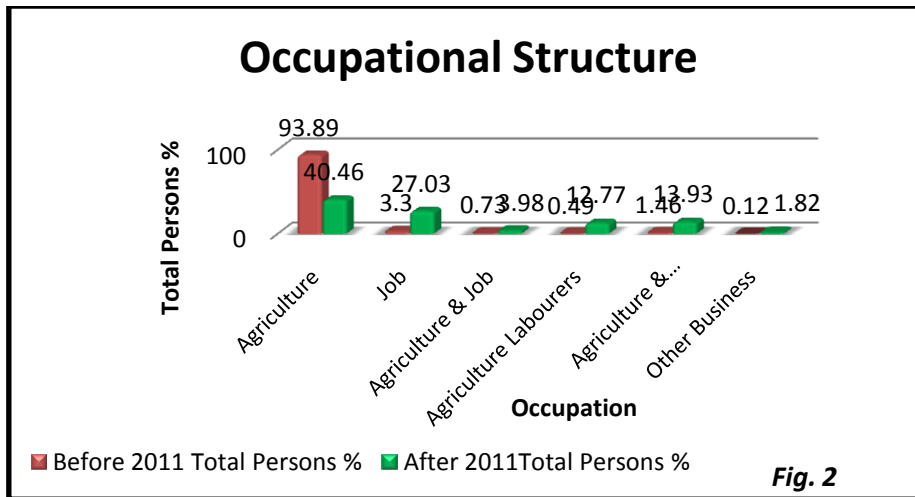
#### **Methods of Data Analysis:**

The collected data have been tabulated using SPSS software and various line graphs, bar graphs, pie charts, have been prepared using MS-Excel software. Future projection of CL and AL is presented using Linear Regression technique. Google Earth Images have been used to locate the change in landuse type. Q-GIS software is used for the preparation of maps of the study region.

### **Results and Analysis:**

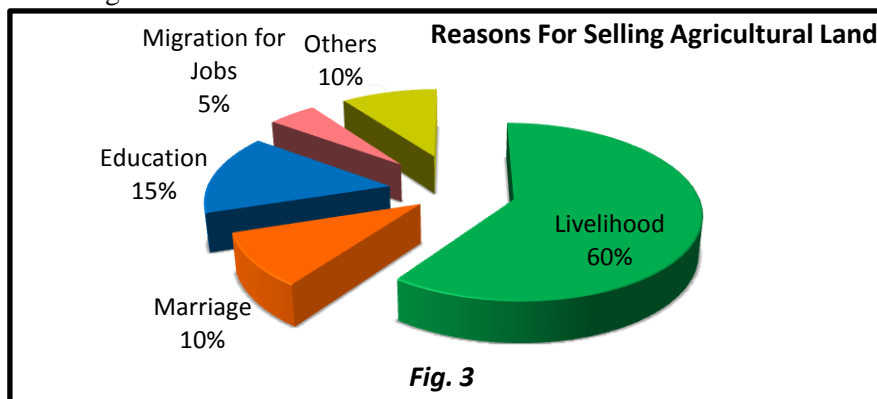
#### **Occupational structure:**

It has been observed that the occupational structure has changed dramatically. After 2011 total persons working in the agriculture are decreased by more than 50%; while the proportion of the population working in other areas increased too much. Fig. 2 depicts the information related to changing the occupational structure in the region.



**Agricultural Landholdings:**

During the course of the investigation, it is noted that 84% of the surveyed families have their own cultivable land, while 16% are landless. Only 3% of surveyed families have purchased new cultivable agricultural land and are practicing farming. The area of purchased agricultural land is 1 acre or less. No one has purchased new agricultural land above 1 acre from the surveyed farmers. It is interesting to note that all the seller-farmers are both small or marginal farmers and they sell-out their agricultural land to meet their special requirements. Most of the people sold their land for livelihood. Education & marriage of children are some other reasons for selling. Fig. 3 provides information on reasons behind the sale of agricultural land. It is necessary to put on record that the change in landholdings is quite significant. After 2011 the number of families having 1 acre & less than acre cultivable land are increased & the number of families having more than 1-acre cultivable land is decreased with the course of time. The change in ownership and landholdings is observed because of the low and decreasing productivity of agriculture. The division of ancestral land is also a reason for decreasing landholdings.



**Change in Agricultural Land Use:**

Change in agricultural land use is quite decreased after 2011, especially after 2013. Ninety-nine percent of families practice subsistence agriculture and take crops once in a year. Grains/ cereals are grown and mainly used to meet the needs of the family. The region doesn't have perennial water supply system hence it adversely affects the annual practice of farming. After 2013, utilization of agricultural land has been changed by 51% families in the surveyed villages. The change in land utilization is much more in the form of putting fallow. Also, some families have converted their agricultural land much more in horticulture. The proportion of utilizing land for growing food crops is decreased drastically and it is because of the Food Security Bill, 2013. Because of food security bill peoples prefer to work as a labor instead of growing food crops in their own field. It is one of the

reasons for decreasing cultivators and increasing agricultural laborers. Fig. 4 and Fig. 5 provide information of proportion of change in agricultural land use.

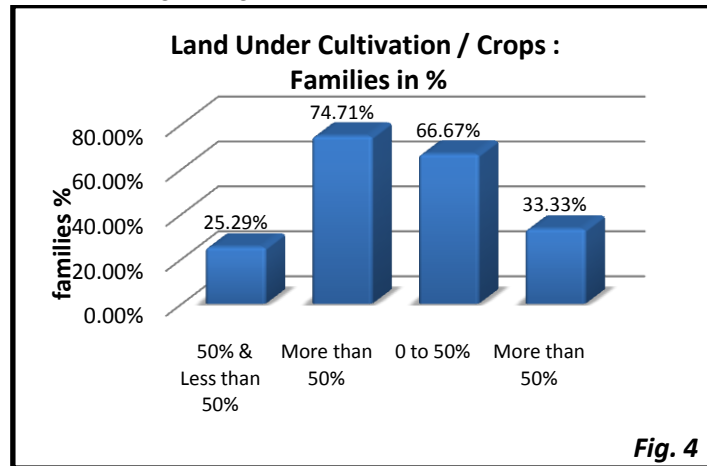


Fig. 4

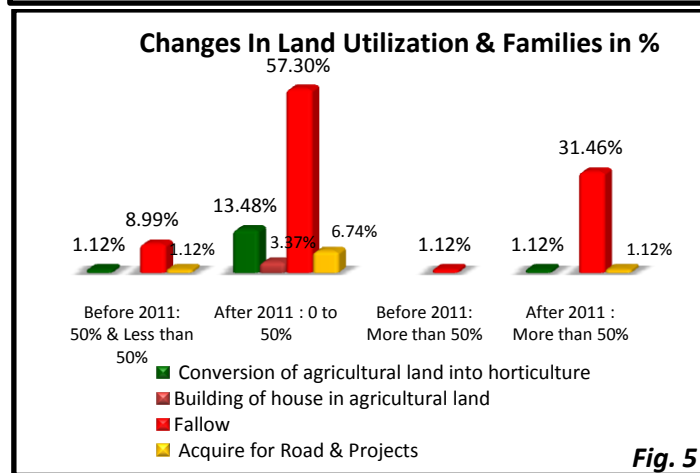


Fig. 5

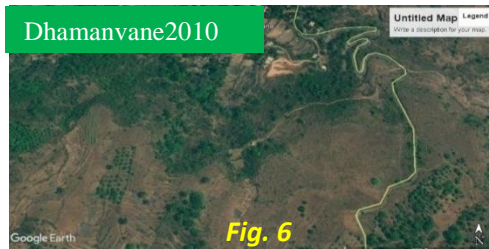


Fig. 6

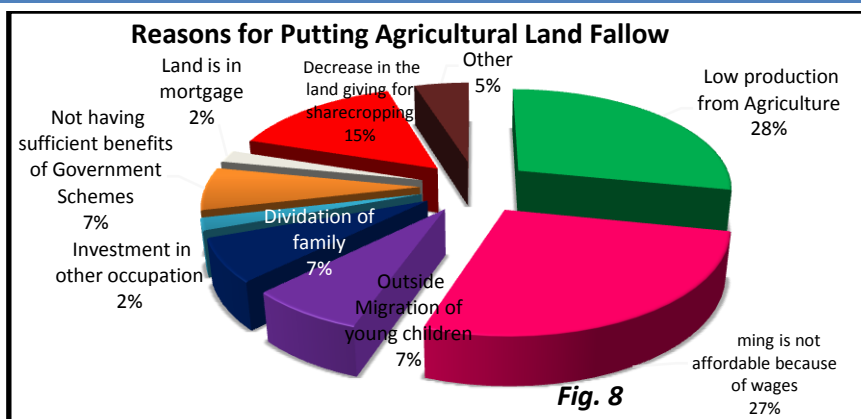


Fig. 7

Fig. 6 and 7 are the Google Earth images of the village Dhamanvane. The change in agricultural land use is clearly seen and it is shown with the yellow marking. The changes are in form of construction of new houses in agricultural land & also in the conversion of agricultural land into horticulture.

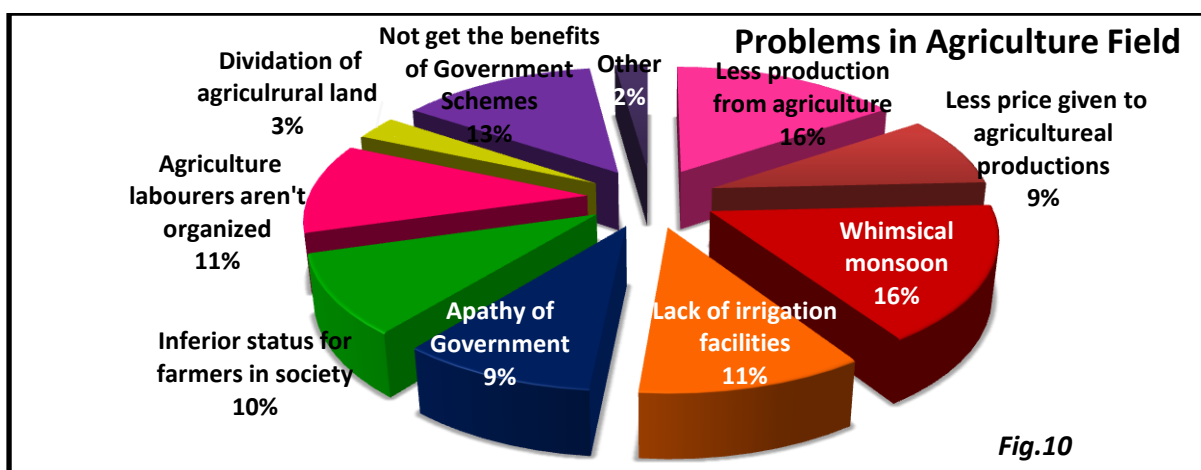
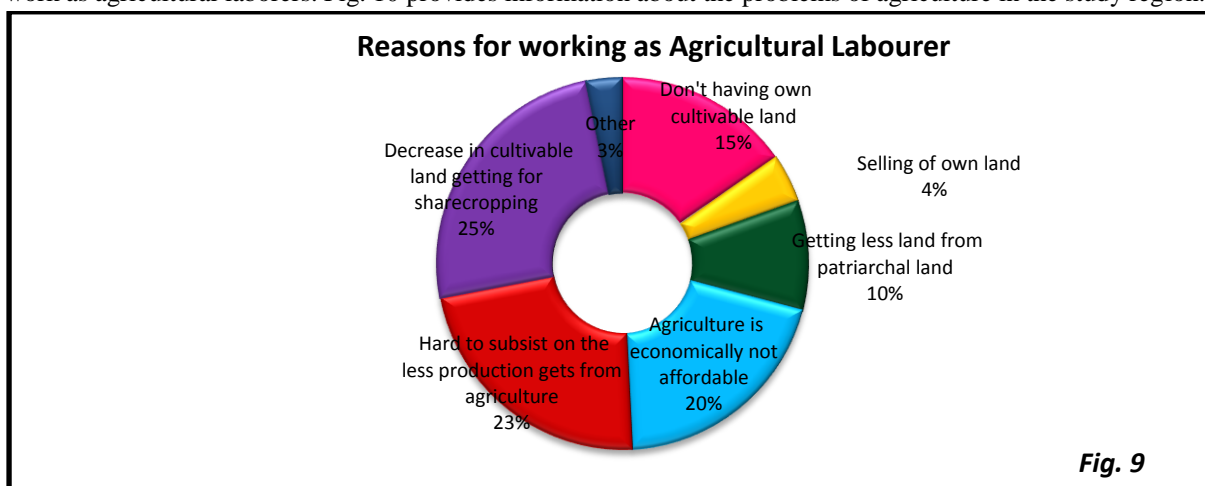
### Reasons for Putting Agricultural Land Fallow:

Fig. 8 gives an idea about the various reasons behind putting agricultural land as fallow land.



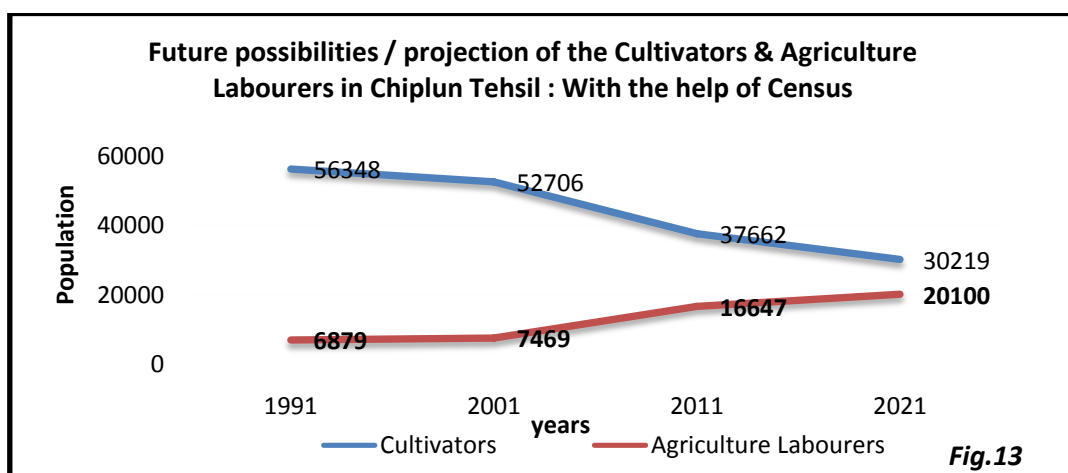
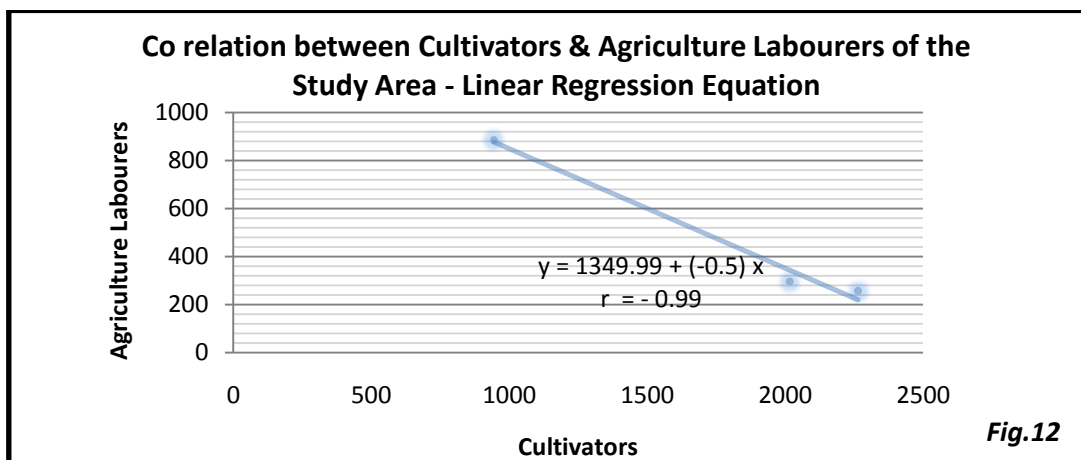
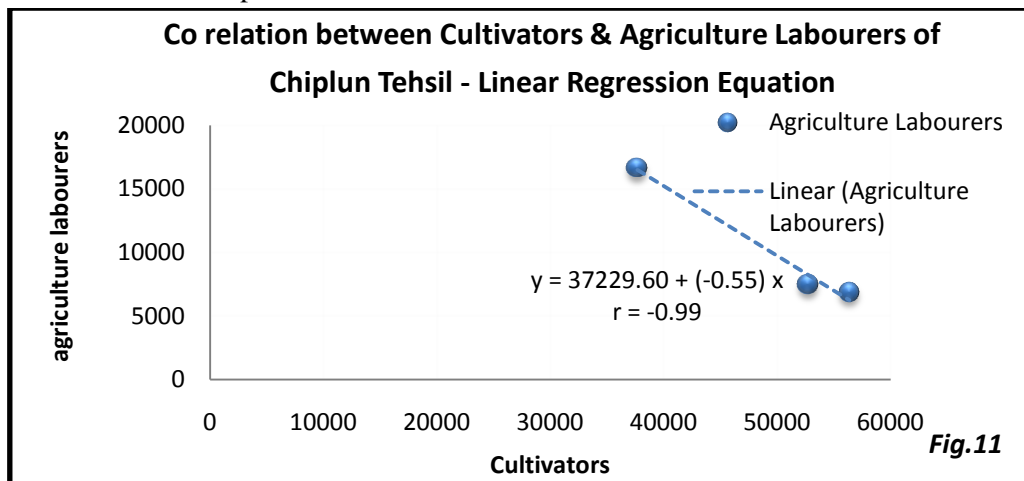
**Reasons behind Increase in Agricultural Labourers:**

It has been observed that changes in agricultural land use promoted the number of agricultural laborers in the region. Among the surveyed families 38% families were agriculture laborers. It is noteworthy that the agricultural laborers increased too much after 2011 in the surveyed villages. Male agricultural laborers get wages of Rs. 300 to 500 per day and female agricultural laborers get wages of Rs. 150 to 300 per day. Whereas for ploughing the agricultural land by traditional methods of Bull cultivators need to pay Rs. 500 to 1000 per day and Rs. 300 to 400 per hour for ploughing by a tractor. The decrease in cultivable land getting for sharecropping, decreasing production from agriculture, uncertain monsoon, Food Security Bill, uncertain prices for agricultural products, etc. are the some of the major reasons for working as agricultural laborers. Fig. 9 gives an idea of causes of increasing agricultural laborers and decreasing cultivators. The agriculture sector of the region is facing a number of agricultural problems. It promoted to put the agricultural land as fallow land and work as agricultural laborers. Fig. 10 provides information about the problems of agriculture in the study region.

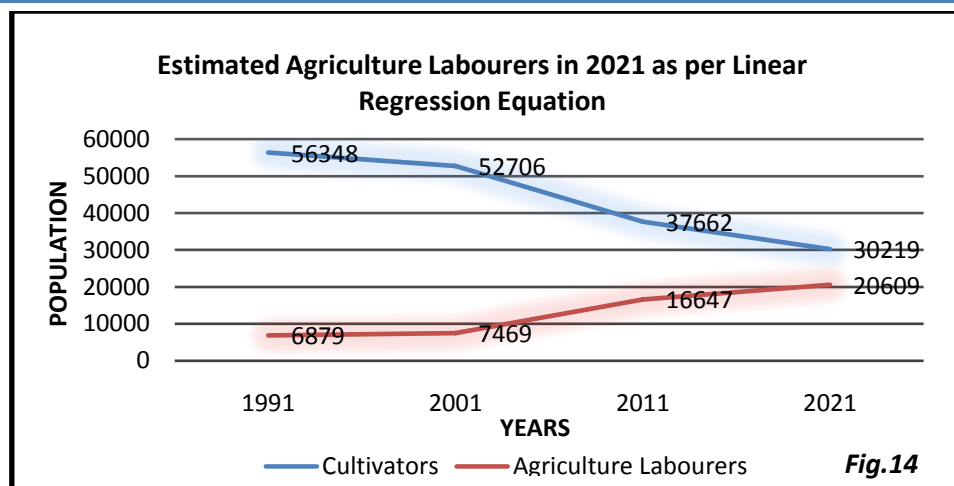


**Linear Regression Equation & Trend Line of the co-relation of Cultivators & agriculture Labourers in the study region:**

The researchers have tried to find out the linear regression equation for the six selected villages for the surveyed families and for the entire tehsil based on 2011 census information of a number of cultivators and agricultural laborers. The correlation value for both is 0.99, it means cultivators and agricultural laborers have a perfect negative correlation. Fig. 11 and 12 depict the linear regression trendline information of the Sangmeshwar tehsil and six selected villages respectively. Fig. 13 and 14, provides information about the future trends of agricultural labourers and cultivators in the study region. Based on future trends lines it can be estimated that the population of Agriculture Labours in Chiplun Tehsil will be in between 20100 to 20609 in 2021 Census.







### Conclusions And Suggestions:

After the systematic investigation of the topic, the researchers come to conclusion as given below.

1. Increase in agricultural laborers is caused because of a decrease in cultivators. The decrease in cultivators is a result of increasing fallow land; climatic and market uncertainty; decreasing proportion of land giving others for cultivation; higher agricultural production cost and lower prices of agro-products; government policies.
2. The linear regression shows that cultivators and agricultural laborers have a negative correlation and the correlation value is 0.99. Based on Regression Equation it is estimated that in 2021 there will be approximately 30219 cultivators & 20100 to 20609 agricultural laborers in Chiplun Tehsil.

### Suggestions:

- Instead of providing food grains at the subsidized rates subsidy should be given to the farmers who are producing food crops using organic farming techniques.
- The focus should be given on the production of crops with Geo-identity. For that researchers should focus to find out Geo-identity of various crops in the locality. It will promote cultivation.
- Rates of the agricultural laborers should be fixed by the government and it should be considered while fixing base prices of agro-products.
- Organization for agriculture laborers at the local level.
- Motivation to the group & organic farming and to give fallow land to sharecroppers.
- Improvement in irrigation facilities, repair of old canals, Four Pillar Rice Cultivation (चार सूत्री भात शेती) SRT Saguna Rice Technology, Cultivation of Bamboo, Vanilla, Spice crops, Motivation for Agro tourism, etc. should be adopted.
- Well channelized awareness programs should be organized by the government at the various levels.

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## Social Status Of Working Women And Their Standard Of Living In Rural Areas : A Case Study Of Shahuwadi Tahsil

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### Abstract

*The present study aims to analyze the social status and living standards of working women in rural areas of Shahuwadi tahsil of Kolhapur district from Maharashtra. Shahuwadi tahsil has been chosen as the study area because it is one of the tahsils in the Kolhapur district which economically based on agricultural activities. The study is based on the primary data collected through field survey of 140 women workers from 14 villages of Shahuwadi tahsil with the help of panned scheduled. Most of the women workers engaged in agricultural activities and poverty, social constrains, etc. were pull of them in to the workforce. Married women in active age group with low education attainment and having large family size mostly participated in the workforce. As living standard is concern, due to the betterment policies of government there is some kind of improvement in living standard of rural women workers.*

**Keywords :** social status, living standards, women workers, agricultural activities

### Introduction

In India, almost 81 per cent female population lives in rural areas. Eventually, work participation rate of female workers is higher in rural areas than urban. Recently, India's Deputy Permanent Representative to UN Ambassador, Tamaya Lal revealed a data in the session of UN Commission on Status of Women, according to that, almost 120 million Indian women which is about 80 per cent of total female workers are employed in the rural sector and more surprisingly this is about 30 per cent of the total workforce in rural areas (Singh, Anita, 2017). The women work participation rate has increased overall from 19.7 per cent in 1981 to 25.6 per cent in 2011 (Census of India, 2011). Most of the women participated in the workforce due to their necessity, instead of their choice. This participation, however, has been largely distress induced and has compelled women to take up jobs which offer very poor wages and no social security (Padma, 2004). Now a days, the gender pay wage gap also shrinking woman work participation. Women earn 57 per cent of what their male colleagues earn for performing the same work (World Economic Forum, 2016). Hence, women are facing so many problems while work participation. This paper throws a light on some of these issues through understanding the social status of working women and their standard of living in rural areas.

### Study Area

The study was conducted in Shahuwadi tahsil in the Kolhapur district of Maharashtra. This tahsil is mainly economically based on agricultural activities. The tahsil is blessed by the River Warana, River Kadvi and River Kasari. Tahsil spreads from 16° 57' 38" N latitudes to 73° 51' 39" E longitudes. As concern to area Shahuwadi is the biggest tahsil of the Kolhapur district and covered 1043.52 sq km area. According to the Census of India, 2011 the total population of the tahsil is 1,85,661 among them 91,869 (49.48%) are males and 93,792 (50.50 %) are females. The tahsil has recorded population growth of 5.00 per cent during 2001-2011. The total literacy rate of the Shahuwadi tahsil is 73.00 per cent, in which 82.00 per cent males and 64.00 per cent females were literate. The sex ratio of the tehsil is 1021. Out of the total population, 97.01 per cent population lives in the rural areas, while 2.9 per cent population livers in the urban areas. It means more than 90 per cent population is directly or indirectly dependent upon agriculture, eventually, agriculture is the mainstay of the economy of the tahsil.

### Objective

1. To study the social status of working women in study area.
2. To understand the living standards of working women in study area.

### Methodology

The entire study is based on the primary data, collected from the intensive field work. For this study, 14 villages and 140 women workers' households selected as a sample through random sampling from Shahuwadi tahsil.

A scheduled was planned in a manner that it was easily communicable to the respondents. Secondary data, in some extent regarding to the study was collected from the District Census Handbook and Gram Panchayat offices of relevant villages.

### Discussion

In India, agriculture is almost main occupation in rural areas both male and female population. Hence, population in rural areas is mainly engaged in the agricultural activity directly or indirectly. But there is a distinct gender inequity found in this kind of work. Apart from that there is some non-agricultural activities are also found in the rural area and gender discriminatory are found here also. Hence this study put a focus on the women workers which is working on the agricultural as well as non-agricultural sector in rural areas. Apart from that some kind of self-employment were also done by rural females. So females, being as women worker have what kind of social status and living standard is tested in this paper.

### Social Status of Rural Women Workers

Data regarding the various aspect of the social status like caste-wise distribution, age-wise distribution, marital status, family size, education, etc. were collected through field surveys and discussed.

**Table 1**  
**Social Status of Women Workers**

1.1 Caste-wise Distribution							
Sr. No.	Particulars	Scheduled Caste		Other Backward Castes		General Castes	Total
1	No. of Women Workers	59	(42.14)	46	(32.86)	35 (25.00)	140 (100.0)
1.2 Age-wise Distribution							
Sr. No.	Age Groups	Scheduled Caste (N= 59)		Other Backward Castes (N = 46)		General Castes (N = 35)	Total (N = 140)
1	15-24	23	(38.98)	13	(28.26)	10 (30.56)	46 (32.86)
2	25-34	15	(25.42)	11	(23.91)	08 (22.86)	64 (45.71)
3	35-44	10	(16.95)	09	(19.57)	06 (17.14)	25 (17.86)
4	45-54	05	(8.47)	05	(10.87)	06 (17.14)	16 (11.43)
5	55-64	04	(6.78)	05	(10.87)	05 (14.19)	14 (10.00)
6	65 and above	02	(3.39)	03	(6.52)	00 (0.00)	05 (3.57)
1.3 Marital Status							
Sr. No.	Marital Status	Scheduled Caste (N= 59)		Other Backward Castes (N = 46)		General Castes (N = 35)	Total (N = 140)
1	Unmarried	11	(18.64)	09	(19.57)	07 (20.00)	27 (19.29)
2	Married	36	(61.02)	25	(54.35)	21 (60.00)	82 (58.57)
3	Widower	09	(15.25)	07	(15.22)	04 (11.43)	20 (14.29)
4	Divorcee	03	(5.08)	05	(10.87)	03 (8.87)	11 (7.86)

1.4 Family Size

Sr. No.	Family Size	Scheduled Caste (N= 59)	Other Backward Castes (N = 46)	General Castes (N = 35)	Total (N = 140)
1	1-5	15 (25.42)	14 (30.43)	11 (31.43)	40 (28.57)
2	6-10	38 (64.41)	29 (63.04)	23 (65.71)	90 (64.29)
3	More than 10	06 (10.17)	03 (6.52)	01 (2.86)	10 (7.14)

1.5 Educational Attainment

Sr. No.	Educational Attainment	Scheduled Caste (N= 59)	Other Backward Castes (N = 46)	General Castes (N = 35)	Total (N = 140)
1	Illiterate	31 (52.54)	19 (41.30)	17 (48.57)	67 (47.86)
2	Primary	22 (37.29)	16 (34.78)	09 (25.71)	47 (33.57)
3	Secondary	06 (10.17)	07 (15.22)	05 (14.29)	18 (12.86)
4	Higher Secondary	00 (0.00)	04 (8.70)	04 (11.43)	08 (5.71)

Source : Fieldwork

Note : Figures in bracket are percentiles

Caste-wise distribution of sample rural women workers shows that 42.14 percent women workers belongs to Scheduled Caste, thereafter 32.86 per cent belongs to Other Backward Caste and 25.00 belongs to General Caste (Table 1.1). As we mentioned women participation in workforce is not by choice but by necessity. Most of time general category women having comparatively high economic status than the Scheduled or other backward caste women, hence there is not any need to participate in the workforce. On the other hand Scheduled or Other Backward Caste women having low economic status eventually they more need for jobs.

Age-wise distribution of sample rural women workers shows that more than 95 per cent women workers belonged to the age-group ranging between 15 to 44 years (Table 1.2). It means most of the women workers were in the active age-groups. It further shows that the women work from early age just to supplement the meager income of the family. This type of women workers found in large numbers in Scheduled Caste. This work hampers their personality and deprives them from education and leaves little opportunities for free physical growth and mind.

The distribution of women workers of different age groups among the different castes shows that the percentage of young women in the age group of 15 to 24 years was higher among the SCs (38.98 %) then the OBCs (28.26%) and General castes (30.56%). This is due to the better economic and social status of general castes than SCs and OBCs. The younger women belonging to general castes do not work in economic activities before marriage due to some religious factors. Moreover in scheduled caste families the women in the early age-group starts to work to supplement their family income.

Near about 60 per cent of the women workers (58.57) were married, while only 19.29 per cent of women workers were unmarried. Remaining 22.14 per cent women workers were either widower (14.29%) or divorcee (7.86%). Among all the caste groups same trends were found in marital status of women workers in rural areas (Table 1.3). Poverty, social restraints, and most of women often look for solace in married life, etc. are the reasons that married women do engaged in the various agricultural and non-agricultural activities.

The sample women workers had very large family size. Since they got married at early age so they had more children. Apart from that, children are considered to be the economic assets in their families. More children mean more helping hands to supplement family's meager income. Most of the sampled women workers live in joint families. Their families constituted young children, adult but non-working unmarried girls and boys, aged parents and other relatives. Almost one-third (64.29%) of

the rural women workers had family size constituting 6 to 10 members (Table 1.4). More than 60 per cent of women workers among all the castes have 6 to 10 members in their families. And again 10.17 per cent sampled women workers from Scheduled Castes had family size constituting more than 10 members. Large family size and more number of dependents in the family have compelled them to work on low wages for long hours at the cost of their physical, mental and social development.

Gender disparity in education is an obstinate problem in Indian society, especially for girls from rural areas as well as lower socio-economic backgrounds. It is also influenced by lack of educational facilities and cultural norms. Among the sampled women workers from the study area nearly half of the women workers (47.86%) were illiterate and never attended school. As different caste groups is concern illiteracy found high in the women workers of Scheduled Castes (52.54%), followed by General Castes (48.57%). The proportion of illiteracy in OBCs' women workers is quite less (41.30%) as compare to above said other caste groups. Overall 33.57 per cent of sampled women worker educated up to primary level and 12.86 per cent educated up to secondary level of school and drop outs. There is only 5.71 per cent sampled women workers educated up to higher secondary level among them proportion of general castes' women workers were high. Schooling of most of literate sampled women workers from Scheduled Castes and Other Backward Castes found up to only primary level. Low levels of education in a situation of extremely limited employment opportunities are major constraints on securing employment in non-agricultural sector, particularly for women. India's constitution guarantees free primary school education for both boys and girls up to 14 years age. This goal has been repeatedly reconfirmed but primary education in India is not universalized (National Commission for Women in India, 1993).

#### Employment Pattern of Women Workers

As Consider to employment pattern, respondent divided in to two broad categories i.e. wage-paid employment and self-employment (Table 2). Agricultural labours and non-agricultural labours are considered in wage-paid employment, while animal husbandry and others such as store, parlor, etc. are considered in self-employment.

**Table 2**  
**Nature of Employment of Women Workers**

Sr. No.	Nature of Employment	Scheduled Caste (N= 59)	Other Backward Castes (N = 46)	General Castes (N = 35)	Total (N = 140)
<b>1. Wage-paid Employment</b>					
i	Agricultural Labour	48 (81.36)	26 (56.52)	16 (45.71)	90 (64.29)
ii	Non-Agricultural Labour	07 (11.86)	11 (23.91)	09 (25.71)	27 (19.29)
<b>2. Self Employment</b>					
i	Animal Husbandry	04 (6.78)	08 (17.39)	07 (20.00)	19 (13.57)
ii	Others	00 (0.00)	01 (2.17)	03 (8.57)	04 (2.86)

**Source :** Fieldwork

**Note :** Figures in bracket are percentiles

According to the Table 2 most of the female workers participated in the agricultural activities such as transplanting of seedling, weeding, harvesting, transporting harvest, threshing, drying of hey, etc. There are 64.29 per cent working women work as agricultural labours. 19.29 per cent working women engaged in weaving, pot making, basket making, construction, etc. consider as non-agricultural labours. As consider to self-employment, there are animal husbandry is most dominated occupation among women from general category. As per caste groups are considered, there were highest number of women workers from Scheduled Castes working as agricultural labours (81.36%)



and 11.86 per cent of Scheduled Castes' women workers busy as non-agricultural labours. There were 56.52 per cent of women workers from OBCs engaged in agricultural activities, while 23.91 per cent women workers engaged in non-agricultural activities. Almost same pattern found in the sampled women workers from general castes.

### Living Standards of Rural Women Workers

The sample rural women workers households were characterized by conditions of their houses, drinking water facilities, toilet facilities, electricity facilities, fuel facilities, etc. Proper shelter is prerequisite for healthy life because it enhances the performances of the residents in their domestic and economic conditions (Edelman and Mitra, 2006).

**Table 3**  
**Living Standards of Women Workers**

3.1 Type of House							
Sr. No.	Type of House	Scheduled Caste (N= 59)		Other Backward Castes (N = 46)		General Castes (N = 35)	Total (N = 140)
1	Katcha and Thatched	06	(10.17)	01	(2.17)	01 (2.86)	08 (5.71)
2	Katcha	08	(13.56)	06	(13.04)	02 (5.71)	16 (11.43)
3	Semi Pucca	28	(47.46)	21	(45.65)	09 (25.71)	58 (41.43)
4	Pucca	17	(28.81)	18	(39.13)	23 (65.71)	58 (41.43)
3.2 Source of Drinking Water							
Sr. No.	Source of Drinking Water	Scheduled Caste (N= 59)		Other Backward Castes (N = 46)		General Castes (N = 35)	Total (N = 140)
1	Public	24	(40.68)	08	(17.39)	06 (17.14)	38 (27.14)
2	Private	35	(59.32)	38	(82.61)	29 (82.86)	102 (72.86)
3.3 Availability of Toilet							
Sr. No.	Availability of Toilet	Scheduled Caste (N= 59)		Other Backward Castes (N = 46)		General Castes (N = 35)	Total (N = 140)
1	Open Ground	03	(5.08)	07	(15.22)	01 (2.86)	11 (7.86)
2	Toilet Pit	18	(30.51)	10	(21.74)	03 (8.57)	31 (22.14)
3	Septic Tank	38	(64.41)	29	(63.04)	31 (88.57)	98 (70.00)
3.4 Source of Light							
Sr. No.	Source of Light	Scheduled Caste (N= 59)		Other Backward Castes (N = 46)		General Castes (N = 35)	Total (N = 140)
1	Electricity	55	(93.22)	44	(95.65)	34 (97.14)	133 (95.00)
2	Kerosene or Other	04	(6.78)	02	(4.35)	01 (2.86)	07 (5.00)
3.5 Fuel Used in Kitchen							
Sr. No.	Fuel Used in Kitchen	Scheduled Caste (N= 59)		Other Backward Castes (N = 46)		General Castes (N = 35)	Total (N = 140)
1	Wood	09	(15.25)	02	(4.35)	01 (2.86)	12 (8.57)
2	Cow Dung	12	(20.34)	03	(6.52)	04	19

					(11.43)	(13.57)
<b>3</b>	Kerosene	04	(6.78)	01	(2.17)	01
						06
						(4.29)
<b>4</b>	LPG	34	(57.63)	40	(86.96)	29
						103
						(73.57)

**Source :** Fieldwork

**Note :** Figures in bracket are percentiles

More than 80 per cent of women workers had semi-pucca and pucca houses. Only 17.14 per cent women workers living in katcha and katcha and thatched houses. As different caste groups is concern, more than 20 per cent of women workers from Scheduled Castes and more than 15 per cent from Other Backward Castes living in katcha and katcha and thatched houses. On the other hand, more than three-fourth women workers from general castes living in pucca houses. Thus it can be inferred that the Scheduled Castes and Other Backward Castes women workers had poor socio-economic status than the general castes women.

Data regarding source of drinking water supply conditions of the sampled women workers is presented in Table 3.2. It reveals that most of the women workers were using water from private connection provided thorough various scheme by the concerned grampanchyats. Almost three-fourth women workers had private connection for drinking water. Remaining women workers were using water from public connection or government hand pumps. As caste groups are concern the number of using public connection is high in the women belongs to Scheduled Caste as compared to Other Backward and general castes and they added that, they have to stand in long queues for the irregular and erratic public water supply.

As toilet facility is concern, due to government schemes and policies sanitation conditions of villages are become well. Accordingly, there were 70.00 per cent sample women workers were having septic tanks, while 22.14 per cent of women workers were used toilet pits. Apart from that, there were 15.22 per cent of women workers from Other Backwards Castes and 5.08 per cent from Scheduled Castes are still suffering to get proper and hygienic sanitation facilities.

Electricity is one the prime necessities in today's era. Data regarding the source of light to the sampled women workers is represented in the Table 3.4. It reveals that, due to government various schemes, almost all the (95.00%) women workers were have access to electricity. Some disparity found among SCs and OBCs but maximum women from general caste having access of electricity. There were 6.78 per cent of women workers belongs to SCs and 4.35 per cent belongs to OBCs were still have not access of electricity and they used kerosene and other oils for lightning.

Due to 'Ujala Yojana' of the Bharat Sarkar most of the women now get LPG connection. Eventually, it is found that almost three-fourth of the sampled women workers (73.57%) used LPG for cooking. Most of the OBCs (86.96%) and general castes (82.86%) women used LPG, while just more than half of the women workers from Scheduled Caste (57.63%) managed to use LPG for cooking. Remaining 42.37 per cent women workers from Scheduled Caste still depend on the other sources like wood, cow dung and kerosene.

### Concluding Remarks

In rural area, large number of women workers engaged in agricultural activities rather than non-agricultural activities and self-employment. It is but off course, due to customs, traditions and social constraints found in our society, especially in rural areas.

Most of women participated in workforce by necessity, poor economic status is more common reason behind it. Eventually a ratio of women participation in workforce is higher in women who belong to SCs and OBCs and having poor economic status. Most of the women workers work from early age to support their families for economic stability in some extent. Again due to poverty, social restraints and for retain peaceful married life married women were most frequently engaged in workforce, basically in agricultural sector. Most of the women workers constitute a large family size, hence they have more number of dependents which compelled them to work low wages for long hours. As a gender disparity in education found in our society, education attainment of women

workers also low. A large number of this type of women workers found in SCs and OBCs as compare to general castes women workers.

Most of the women workers had semi-pucca and pucca houses, private drinking water supply, better sanitation facilities, electricity and fuel facilities due to various scheme introduced by the Government for betterment of rural population.

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## Industrialization And Rural Transformation In Kolhapur District

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### Abstract

*The industrialization plays major role in the transformation and development of rural areas of Maharashtra as well as India. This paper aims to study the Industrialization and diversified rural economy produced transformation of rural areas of Kolhapur district of Maharashtra. For that, the data and information is collected from news papers, articles, magazines, internet websites, and expert interviews. For the present study the Composite Index of Development will be adopted. It help to summing up the ranks of various indicators adopted to measure the development. Simultaneously Method of Proportional Standardized Mean (Srivastava, 1983) will be used for different weights of different indicators. The study indicates that the Industrialization supports to the commercialization of the agriculture activity. The commercialized agriculture is becoming the cornerstone of socio- economic development of agrarian society. Society is shifting towards the commercialization of agriculture from the substance agriculture. The industrialization and commercialization of agriculture enhance the economic development through the increased employment and economic growth results the transformation into the life in the rural areas.*

*Keywords: industrialization, rural transformation, development, economy, employment generation*

### Introduction

The rural transformation deals with the changes in the rural society and economy in the desired directions and develops the rural landscape with the development of the employment, agriculture, services and business opportunities. The industrialization plays major role in the transformation and development of rural areas of Maharashtra as well as India. It helps to provide the huge amount of employment opportunity in the adjacent areas and becomes a key factor of rural development (Ahamad, 2015). The study region reflects the industrialization resulted rural transformation. So we should special inspect the interrelationship between the industrialization and rural transformation.

### Objective:

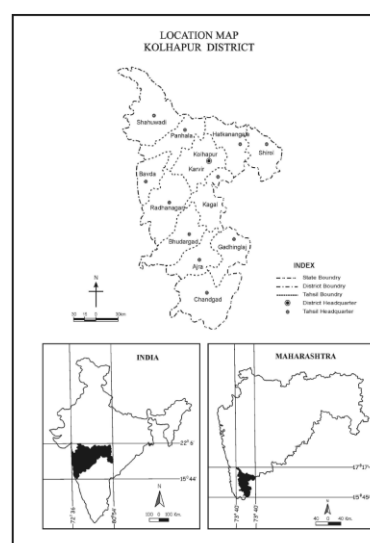
This paper aims to study the Industrialization and diversified rural economy produced transformation of rural areas of Kolhapur district of Maharashtra.

### Study Region

The Kolhapur District located in between 15°43' N and 17° 10' N latitude and 73°40' E and 74°42' E longitude and covers 8,047 sq.km geographical arera. The district between Sangli district at the North, Sindhudurg and Ratnagiri districts and Belgaum district of Karnataka State at the West and East. The physically it is varied in nature, consisting plains, plateaus and hill ranges.

### Methodology

The exploratory-cum-descriptive research design will be adopted for this research work. The primary and secondary data will be collected from different sources like records of Incentive programme like IADP, IAAP, DPAP, SFDA, HYVP, IRDP etc. DRDA Reports, of various committees and commissions, Journals, Research studies, Articles, Text books, periodicals other published-unpublished materials and Government's reports, publications etc. Primary data will be collected with the help of stratified random sampling through the prescribed questionnaires with personal interviews of beneficiaries as well as related persons and experts.



For the present study the Composite Index of Development will be adopted. It help to summing up the ranks of various indicators adopted to measure the development. Simultaneously Method of Proportional Standardized Mean (Srivastava, 1983) will be used for different weights of different indicators.

The various geographical, economic, social and infrastructural indicators will be used for the analysis. Various suitable statistical techniques like mean, percentage, standard deviation, correlation etc. used as per requirement of analysis. The composite score will be used to understand the level of human resource development and the agricultural development.

The useful cartographic techniques will be used for the presentation of data in the form of distributional maps and graphs. The Q-GIS Software will be used for the analysis and presentation of multivariate information with the maps.

### Analysis

#### Scenario of Agriculture and Industrializations in Kolhapur District:

Administratively Kolhapur district divided into 12 talukas and having 3874015 (2011 Census) population. It consist two cities, 12 towns and 1203 villages. The ratio of urban- rural population is approximately 25% : 75%. It is well watered and agriculturally developed part of Maharashtra having several agro-industry e.g. sugar manufacture, agriculture produce processing, milk and food processing. Industrially several large, medium and small industrial units developed in the district. The area covers under the Kharif 376600, Ha & Rabi 34900 Ha in the Kolhapur district. (<http://kolhapur.nic.in>).

The Kolhapur district have 13 MIDC's with 3928 industries with 390 red type industries, 406 Orange type industries and 3132 green industries. There is large number of sugar, distillery, small foundries and cloth processing industries are exist in sub-urban region of Kolhapur district. It consist 21 spinning mills (co-operative and private), 21 textile mills, 15 sugar industries and remaining 53 units are of engineering, foundry, chemical, poultry, and animal food etc. There are 2 existing MIDC (Maharashtra Industrial Development Corporation) and 4 are proposed with total of 1207 industrial units.

Sr. No.	Name of the Industrial Area / MIDC	Area
1	Shiroli	254.19 (Hector)
2	Gokul Shirogaon	219.06 (Hector)
3	Ajara	06.01 (Hector)
4	Halkarni	192.53 (Hector)
5	KagalHatkan gale	1085.01 (Hector)
6	Gadhingalaja	132.52 (Hector)
7	L.K. Akiwate Inds.Estate, Jaysingpur	29.40 (Acres)
8	Ichalkaranji Inds.Estate, Ichalkaranji	206.22 (Acres)
9	Kolhapur Udyam Co-op.Inds. Estate, Kolhapur	08.49(Acres)
10	Yashawant Co-op. Inds.Estate, Hupri	08.00(Acres)
11	Laxmi Co-op.Inds. Estate, Hatkangale	79.82 (Acres)
12	Parvati Co-op.Inds.Estate, Yadrav	218.18 (Acres)
13	Chh.Shahu Co-op.Inds.,Estate, Shirol	12.74 (Acres)

#### Industrial Scenario of Kolhapur district

Sr. No.	Category	Number of enterprises			Employment Generation			Investment (P&M)(Rs.In lakh )
		Mfg.	Service	Total	Mfg.	Service	Total	
1	Micro	14280	1945	16225	90860	3744	94604	97001
2	Small	5360	18	5378	67442	226	67668	126096
3	Medium	17	0	17	4340	0	4340	12737
4	Large scale	553	-	553	164072	-	164072	243100
	<b>Total</b>	<b>20210</b>	<b>1963</b>	<b>22173</b>	<b>326714</b>	<b>3970</b>	<b>330684</b>	<b>478934</b>

### **Role in Rural Transformation:**

The industrial development and resulted socio-economic transformation dramatically changed the rural areas of the Kolhapur district as well as Maharashtra. The natural and human resources in the rural areas affecting on the rural production and lifestyle with the industrial development. The interaction of industrialization and subsequent social and economic transformation is playing the significant role in the balanced rural-urban development (Long et al, 2009).

The Industrialization supports to the commercialization of the agriculture activity (Todkari 2012). *The* commercialized agriculture is becoming the cornerstone of socio- economic development of agrarian society. Society is shifting towards the commercialization of agriculture from the substance agriculture. The industrialization and commercialization of agriculture enhance the economic development through the increased employment and economic growth results the transformation into the life in the rural areas.

Industrial development helps in skill development while employment and improve the rural urban relations with the collaborative and collective economy. With the consideration of the sustainability of the rural environment the industrial growth in desired level becoming the widely acknowledged engine of economic transformation. It can transform agrarian economy to industrialized one along with raising the level of rural income and welfare. So this study helps us to understand, how the expansion of the rural industrial sector for the implementation of socio economic transformation.

The prominent agrarian economy of the rural part of the Kolhapur remains economically backward due to the lack of dynamics of industrialization and relatively low level of industrialization. In this study an attempt to examine the industrial growth during the last 25 years and resulted socioeconomic transformation in Kolhapur district.

### **Conclusions**

The study would help various policy makers to encourage the industrialization in the rural areas and maintain the regional socio economic balance in the society. It also support to rational and sustainable utilization of the natural and human resource. It helps to understand the role of rural activities into the national economy. It supports to determine the priority of the socioeconomic sector for the acceleration of the socioeconomic development process. The Industrialization supports to the commercialization of the agriculture activity. *The* commercialized agriculture is becoming the cornerstone of socio- economic development of agrarian society. Society is shifting towards the commercialization of agriculture from the substance agriculture. The industrialization and commercialization of agriculture enhance the economic development through the increased employment and economic growth results the transformation into the life in the rural areas.

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## **Pais: Agro-based Tourism**

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### **Introduction:**

In this world of globalization and speedy life, life style of human-being has changed radically. Everyone is in great pressure and living in so called flat system, where no one has time for their neighbours. Everyone is in search of peaceful life and wants to spent their spare time in the shelter of nature. So, we will come across many agro tourism farms. These farms provide us the peace of mind. Agro-tourism involves any agriculturally based operation or activity that brings visitors to a farm. It also includes buying produce directly from a farm, picking fruits, feeding animals or staying at bed and breakfast on a farm. Agro-tourism is considered as growing industry in many parts of the world. Agro tourism is also known as “Sustainable Agriculture”. Agro-tourism provides a chance for the tourists to come to the mother nature.

### **Objectives:**

1. To know the concept of agro-tourism
2. To focus on the Pais agro-tourism centre.

### **Research Methodology:**

Descriptive research design is used for present research.

### **Sources of data:**

Both Primary and secondary data is used to prepare the present research paper. In India agro-tourism is developed from 2004. First agro-tourism center is started in Baramati Agri tourism center under the guidance of Pandurang Taware. He had received National Tourism Award. The pioneer for developing agri tourism concept in India is Agri tourism India

Love for nature makes anything possible. If you want to live with the nature and enjoy the peaceful climate to relax your pressurized mind, the nearby place where you can visit is Pais. Pais, the residential and agro tourism is developed in very small area with low investment and by using 80% of waste material. Wood used for packing, waste plywood etc. has been used to structure cottage, recreational hall, kitchen room etc.

Unused Mozek tiles, small pieces of pavings block and other materials are used to build 7 feet wide and 1000 feet long internal foot path and flower climbers are used

Pais gives the future generation to know about the lifestyle of the village people. Garden is made out of the use of old roofs and the cuttings thrown by the local people. Loan is so beautiful that we cannot even guess it is prepared by the waste materials.

Cashew nuts, mango, coconut etc are main attraction of the Pais. Like this many other fruits and flowers trees are planted which gives happiness to the every member who visits the pais.

Pais also encourages the small farmers to make the experiment in their respective field by developing these type of structure and earn their livelihood. They take the initiation to aware the people about the importance of agro-tourism, thereby to develop the sense of humour to produce income in their barren land.

Pais with the help of social media encouraging and taking lead to aware the people about the importance of the agro – tourism concept which will help them to lessen their poverty.

Natural Resources and Cultural Programmes:

There is reserved forest area of 200 acres from 10 minutes from the pais. One among the Navadurga i.e. Katyayani Goddesses temple is also situated nearby pais. Bhima Shankar temple, Kaneri Math, Kalambalake, Rankala lake is also located from 15 minutes distance of Pais. This helps the tourist to enjoy the beauty of nature.

**Other Facilities;**

Bulluck cart ride, Poultry farming, Recognition of cereals and pulses also main attraction of the Pais agro-tourism.

Films during Shivaji dynasty are shown in the open area of 1000 sq. feet by the projector.

Birds, Animals and Social Responsibility:

Pais is known for the Social responsibility. All fruits and flowers of the Pais area is reserved for the non governmental organization like Avani and Ekati and also for the differently abled persons. Board is displayed in the entry about the reserved fruits and flowers for the depressed classes of the society.

Old tyres being used to provide water to the birds in the summer season so that birds will not die because of non-availability of water.

**Employment generation:**

Employment opportunity is created by the Pais by providing employment to the women and the children who are learning by earning.

**Conclusion:**

To conclude with we can say that many social responsibility is undertaken by the Pais for the wellbeing of the people at large and also provides the peace of mind by developing agro tourism. Many famous personalities are visited to the Pais like grandson of Mahartma Gandhi Arun Gandhi and family, many collectors and famous personalities and also it becomes centre of attraction for the foreign tourist. So, researcher is of the opinion that agro-tourism must be developed to the greater extent to develop the economy of the country to the greater extent and Pais is oe of the best agro tourism centre where one can relaxe and will have peace of mind.

## **Economic Supportive Role of Gokul Duddh Sangh in the Rural Development of Kolhapur District**

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### **Introduction**

The present research paper studies "Kolhapur District Co-operative Milk Producers' Association Limited Kolhapur" (Kolhapur Zilla Sahkari Duddh Utapadak Sangh Ltd. Kolhapur) which is popularly known as Gokul Milk Association. Kolhapur District Co-operative Milk Producers' Association Limited is a co-operative association that contributes to the financial development of milk producers in Kolhapur District. Gokul Milk Association collects milk from the producers and it is continuously implementing diverse activities to provide its best value to the milk producers in this area. The Planning and Management of Gokul Milk Association is centered in the interest of milk producers. Presently, milk is supplied to the Gokul Milk Association through 5773 Primary Milk Co-operative Dairies. 1220 villages have formed Primary Milk Co-operative Societies. 3,96,000 households have milk producing animals. In this area, Gokul Milk Association has provided economic benefits to the lakhs of families. Gokul is considered as the leading Milk Association in Maharashtra. Gokul Milk Sangh collects and distributes 16,75,000 liters of milk per day. It has decided 470 road-ways to collect milk. It has established its packing centers at Gokul Shirgaon, Washi and Pune. The packing capacity of these centers is 81,00,000 liters of milk per day. The annual milk collection of Gokul Milk Sangh is 423 million liters, out of which buffaloes' milk is 48% and cows' milk is 52%. The average milk collection of Gokul Milk Sangh is 11,59,000 liter per day.

### **Study Region**

The area of operation of Gokul Milk Sangh is entire Kolhapur District. Kolhapur District is situated in the extreme southern part of Maharashtra state. It lies between from 15° 43' north to 17° 42' East longitude. It is surrounded by Sangali District to the North; Belgaum District of the Karnataka State to the east and the south; Ratnagiri and Sindhudurg Districts to the west. Kolhapur District has an area of 7685 square km., comprising of 12 Tahsils. Gokul Milk Sangh is located in Karveer Tahsil. The physiographic of the district may be grouped in three parts i.e. firstly the Sahyadri hills in the north and south direction, secondly the plateau region to the east of the Sahyadri hills and thirdly the river valley basin of Bhogawati, Kumbhi, Warana and Panchaganga.

The variations are due to the geographical complexity of the region and varied geographical complexity of the region and varied geographical evolution (Deshpande, 1971). The climate of Kolhapur District is generally temperate. The average annual rainfall varies from about 600mm in Shirol Tahsil in the east to 6000 mm in Gaganbavada Tahsil in the west. The total population of Kolhapur district is 40,55,000 in 2018. Therefore, Kolhapur District Co-operative Milk Producers' Association Limited Kolhapur (Gokul) has been selected as a study area for the present research paper.

### **Aims and Objectives**

- 1) To study the growth of milk collection of Gokul Milk Sangh.
- 2) To study the measure adopted to improve milk quality.
- 3) To study the services provided to the milk producers and the service class.
- 4) To study the grants distributed to the milk producing farmers.

**Data Base and Methodology :-** The Secondary data is used for the purpose of analysis and interpretation. The secondary data is referred from District Census Handbook, Socio-economic Abstract of Kolhapur District and Journals, books, articles, government published annual reports

and Kolhapur District Cooperative Milk Production Sangh –annual report, websites etc. The collected data is computed by recent research techniques and the results are brought through tables.

**1.1 Green Fodder Development Programme (VairanVikasYojana)** is initiated to ensure supply of best quality green fodder to the animals. It is very important for the improvement of the animals. If the proper green and dry fodder is given to the animals in the right quantity, their health improved and the milk gets better. Therefore, farmers are given financial help to produce good quality fodder. Fodder seeds are distributed to farmers on a 25% and to 50% subsidy as per season, as well as during the whole year. Thus, VairanVikasYojana is improving the livestock diet of livestock.

**Table No. 1.1**  
**VairanVikasYojana for improving the livestock diet (2017-18)**

Sr. no	Particulars	Distribution
1	Maize	57750 kg
2	Bitter	92005 kg
3	Maidandishal	117564 kg
4	Multi year grass	409900 sets
5	Hand cutter	3192 sets
6	Chaff cutter	1003 sets
7	Silace bags	13388 sets
8	Garlic nutritive feed	854 kg
9	Hydroponic set	35 sets
10	Animal feed annual production	118905 m.tons

Source :- Annual Report of GOKUL 2017-18.

The method of storing green fodder throughout the year is called silage. It provides the facilities of providing green nourishment to the livestock throughout the year. It is helpful in improving the health and fertility of the livestock and it boosts milk production. During the year 2017-18, 13288 silage bags are allotted to the farmers. Hydroponic technique is used to produce green fodder without the soil in the low water plastic tray or plastic pipe tray. This technique is called hydroponic technique which ensures production and quality of milk. Distributing the hydroponic set subsidy to the milk producers through the Sangh, which show that five thousand rupees are spent to generate 50 kg. of green fodder per day and for the production of 100 kg. of the green fodder per day it costs rupees 10000/-.

The method of storage of green fodder throughout the year is given in aerated condition. Hence, it is possible to give green nutritional fodder to livestock throughout the year so as to improve the health and fertility of the livestock and increase in the production of milk.

**Table No. 1.2**  
**Medical Services Supply to Animal Husbandry**

Sr.no	Particulars	Numbers
1.	Veterinary center	30
2.	Wandered dispensaries	45
3.	Drug treatment animals	282939
4.	Urgent services	159721
5.	Number of village covered in the services	1873
6.	Record number of calf rearing	499097
7.	Number of animals included in medical services	5475
8.	Annual artificial insemination case	269389

Source :- Annual Report of GOKUL 2017-18.

## 1.2 Medical Services Supply to Animal Husbandry

Modern technology is used for the promotion of milk business by Gokul Milk Union in Kolhapur district. Gokul has provided to the milk producing farmers services such as the Veterinary Services, Road essential services, Artificial insemination management program, Chaff cutter supply, Diet balance vaccination, Farmer's Fair, Collective Disinfection Scheme etc. to improve the health of livestock continuously as shown in the table 1.2. Gokul Sangh provides medical facilities from 30 departmental Animal Husbandry Centers in their area of work. It is providing this service through the 406 "Walking Artificial Insemination Centers" for breeding of species of animals in Gondulas of Gokul Sangh.

## 1.3. Gokul Female Calf Rearing Scheme

Since 2005, Gokul has started calf rearing scheme for the farmers. The main purpose is to breed calves in the milk producing farmers' granules and reduce the number of killings. It also intends to get proper calf and to get all the calves in the appropriate period. Packages to 50% subsidy on "Milk Replacer Kaff Starter Weight Expenses" are reduced. This helps in breeding of milch animals. In 2017-18 under this scheme, milk producer farmers were provided Rs 1,14,41,000 for cows and Rs.6,00,68,000 for buffaloes so that poor milk producers of the rural areas can get valuable financial assistance.

## 1.4 Farmers Package Policy

In order to provide financial support on the sudden loss due to natural calamities of milk producers or financial loss due to death of animals, Gokul Milk Sangh has started a "Farm Package Policy" of New India Insurance Company. In the year 2017-18 through 608 milk organizations, 21,030 milk producers have participated in this scheme. Total amount of Rs. 32,18,540 through Sangh was sanctioned in the form of grants for medical services to animal husbandry.

## 1.5 Women's participation

Women play a very important role in dairy business. They are pillars of this business. The milk business gives financial stability to the women. "Women's Co-operative Leadership Development Program" is implemented with the intention of increasing women participation in decision-making and competition in Milk Production Centers. Therefore, the technical support service facility helps in the successful management and organization of Milk Producers' Women Savings Group. It helps in increasing milk production. Under this scheme, women are given actual information through tourism at Gokul Project Animal Husbandry factory. In 2017-18 through this scheme, 4574 women are benefited.

## 1.6 Dairy and Animal Husbandry Training Center

Training and education are essential for the overall development of any business. Training is important for the development of professional skills. Through Gokul Milk Producers' Association, farmers are trained in milk inspection in Kolhapur district as well as in Maharashtra and other states with Pancham Committee's balance of equilibrium. Modern milk business volunteers, supervisors secretary, Artificial insemination, Servant collection are given training. So far, on behalf of this team 32,423 trainees have been provided with residential training facilities to increase in milk production. The training is necessary for development of milk business and to change traditional mindset about milk business.

## 1.7 Workers' Welfare Board

Workers' Welfare Board has been set up with the aim of securing mental health and financial benefits to the employees of Gokul Sangh working in Gokul Milk Union. Through this, the permanent employee can avail medical expenses in the sickness of his wife and two kids and parents. If an employee dies in the service, his/her family is given a financial assistance of forty thousand rupees. If no employee has ever taken medical help till his retirement, then Rs 25 thousand is paid on his/her retirement. Labor Welfare Board sanctions 25000 thousand in emergencies. Besides, Medical leave is sanctioned to the employees. In 2017 18, a total of 473 employees were provided with 55,38,800

rupees towards medical assistance on behalf of the Labor Welfare Board. The Gokul Sangh has been able to make an efficient planning about the health of its employees.

### 1.8 Milk Association's Financial Management

Milk Association's financial management is working with the main objective of providing maximum financial benefits to the milk producers and the convenience of the milk producers. Amount of 81.59% is given to the milk producers and only 18.41% of the funds are used for the management of the Gokul Sangh.

**Table No. 1.3**

#### Financial analysis of Kolhapur district co-operative milk products Gokul sangh (2017-18)

Sr.no	Particulars	Rupees in lakhs	Percentage
1	Net profit	690.01	0.32
2	Net interest	1102.08	0.52
3	Depreciation	851.91	0.39
4	Management and distribution expenses	2183.22	1.02
5	Servant class expenses	9446.92	4.42
6	Collection ,cattle feed cost, dairy costs	25109.27	11.74
7	The amount received to milk producer	174544.08	81.59
	Total	213928.27	100

Source :- Annual Report of GOKUL 2017-18.

Despite the provision of utilization of more than 18.59% funds for team management, the team management is successfully operating at minimal cost considering the interest of the farmer.

### 1.9 Kolhapur District Cooperation Milk Productive Santha

Table 1.4 shows the drastic change during the span of 50 years (1968 to 2018). The ratio of economic benefits increased in terms of dairy milk collection, per day compilation of milk and financial benefits of milk producers. Indian government started 'Operation Milk Flood scheme ' for the growth of milk production.

**Table1.4**

#### Kolhapur District Cooperation Milk Productive Santha

Year	Annual Milk Collection (in Liters)	Daily Milk Collection (in Liters)	Net Profit (in Rupees)
1968	2176506	5963	27891
1978	21265755	58262	35172
1988	51154382	159327	5658830
1998	159752418	438880	20562301
2008	178346431	487285	51599178
2018	423035460	1159001	69000838

Source :- Annual Report of GOKUL 2017-18.

Based on this scheme Gokul Milk Sangh started providing artificial insemination schemes and frozen semen at a large scale to the farmers. Because of this one can see the growth of milk production by well-breededcattles.

### 2.0 Problems of Kolhapur District Cooperation Milk Producer Sangh

1. Traditional methods of milk production.
2. Less income of milk Production compared to the numbers of cattles.
3. Economical infirmity of milk producers.
4. Existence of old family tree of cattles.



5. Lack of cold storage or refrigerator facility.
6. Less buffalo milk production than market demand.
7. Coalition of politics in Kolhapur District co-operative milk producer's Union
8. Due to daily perishable milk, the financial loss of the primary milk collection institution is reported.

## 2.1 Measures

Since the domestic and international market prices have diminished, the team has left the powder and butter stock worth Rs. 203 crores, and despite all the financial problems, the management has accepted the milk from the producers.

1. In order to understand the traditional mindset and practice of dairy business and to give a new technology, 32,232 people have been given residential training. This quantity should still be increased.
2. To maintain the safe and clean milk produced, it is necessary to maintain 35,900 liters of milk per day in the village level.
3. In the field of Gokul Milk Union, majority of farmers are financially vulnerable, they have been given 8,43,000 rupees for purchase of cows and buffaloes.
4. To ensure accurate diagnosis of different animals, according to which drug propagation of milk producers should be spread and propagated.
5. For a special increase in buffalo milk production, it is necessary to provide more subsidy for purchase of buffaloes
6. Political management must be done for the development and economic development of Gokul Milk Unions and milk producers.

## Summary

Kolhapur District Co-operative Milk Producer Sangh Limited (Gokul) is the leading cooperative Milk Union of Kolhapur. About 39,600 families of 122 villages are getting financially sanitized soundly through this Milk Association. Management of Milk Sangh is very competent keeping milk producers at the center. It has implemented many schemes for milk producers leading to development of animals and milk producing farmers. It has implemented successfully the schemes such as Vairan Vikas Yojana, Animal Husbandry Medical Service Scheme, Farmers package policy, Women's participation, Skills Development Scheme, Gokul Kamgar Kalyan Yojana, Milk Business, Animal Husbandry Training Center etc. Gokul has implemented all the schemes very efficiently for the milk-producing farmers. Gokul Milk Union's transparent financial transaction has led to the growing of confidence among the milk producers. With transparency of the Gokul Milk Union, today Gokul Milk Union has become a financial center in the district.

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## Cropping Pattern and its Impact on Agricultural Development: A Comparative Study of Western Maharashtra and Vidarbha

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### Introduction:

Cropping pattern is one of the most basic tools for transformation of agricultural development. The overall expenditure of farmers can be controlled by all inputs of production. Agriculture development has helped in modernizing the rural and agrarian economy of the country. It is a positive input in agricultural development. It is also helpful in the growth of irrigation facilities and increases the area under irrigation and also helpful in several other farm activities such as threshing, drill machine, cutter etc. On the eve of the First Plan, agriculture was in a hopeless and deplorable condition. Our farmers were in heavy debt and most of them were dependent on village moneylenders. They were having small and scattered holding. They had neither money nor the knowledge to use proper equipment, seeds and chemical manures. Productivity of land as well as labour had been declining and was generally the lowest in the world. To bring about increase in agricultural production and also increase in employment, the Five Year Plans were drafted considering the various programmes and agricultural extension services throughout the country, expansion of irrigation facilities, fertilizers, pesticides, agricultural machinery, high-yielding varieties of seeds, expansion of transportation, power, marketing and institutional credit. With the adoption of new agriculture strategy in 1965-66, the traditional method of agricultural was replaced by modern package of inputs in India. After the adoption of new technology there was an increase in per hectare productivity of agricultural production. The overall production has increased and this has helped in increasing income levels of the farmers. Adoption of modern techniques has changed the cropping pattern in selected area of this study. The subsistence farming was replaced by commercial farming. The productivity of the farms has increased considerably.

### Research Methodology:

In Maharashtra State, there are five regions; these are Konkan, Western Maharashtra, North Maharashtra, Marathwada and Vidharbha. Out of which, Western Maharashtra and Vidarbha have been selected for the analyzed the impact of cropping pattern on agricultural development. The study is limited to the survey of Western Maharashtra and Vidarbha regions of Maharashtra State only. In Western Maharashtra region, there are 6 Districts out of which 2 Districts have been selected. In Vidarbha region, there are 11 Districts out of which 2 Districts have been selected for analyzing the impact of cropping pattern on agricultural development. The study covers selected Districts from the Western Maharashtra viz; Kolhapur and Solapur and from Vidarbha viz; Nagpur and Yavatmal. The study period is limited to only the year 2001 to 2017.

### Cropping Pattern and its Impact on Agricultural Development:

As per expectation, use of various tools leads to expansion of irrigated area and ultimately it leads to more output and more employment opportunities in agricultural sector in rural economy. Farmers shift crops from low value to high value, which in turn raises the level of output. Changing cropping pattern from low value to high value can help in increasing the production of commercial crops or cash crops in selected area of the study. It can widen the area of irrigated lands. It changes the traditional pattern of agriculture and helps in improving the living standard of sample farmers. In this paper the impact of cropping pattern on agricultural development of all sample farmers has been explained. "Cropping pattern means the proportion of area under different crops at a particular period of time. A change in cropping pattern means a change in the proportion under different crops. Cropping pattern in agriculture among other things is ultimately governed by farmers' choice of crops in individual farms." (\*Mamoria C. B. (1999): "Agricultural Problems of India", Published by KitabMahal, Allahabad. (p. 101)} The choice for growing a particular crop in a particular part in sample district depends on the following factors; size of landholding, techniques of cultivation, changes in the market price, irregular monsoon, the government policy and new technology. Sample farmers have used electricity and other tools for various methods of cultivation such as water lifting, sprinkling, drip irrigation etc. This has resulted in increase of irrigated area in the sample districts. Due to various tools change has taken place in cropping pattern in sample districts of Western Maharashtra and Vidarbha region of Maharashtra state. With the use of various tools for agricultural activities, traditional cropping pattern has changed into commercial one. All sample farmers asserted that they have adopted the new cropping pattern. In general, it has been observed that the use of various tools changed the attitude of farmers. Sample farmers started focusing their attention on

commercialization of crops in order to increase their earnings. Because of it the area under food grains has reduced and the area under the non-food grains has increased. Farmers are now deriving more benefits by growing crops such as fruits, vegetables, flowers etc. The use of various tools along with electrification for the purpose of agriculture has changed the farmers' life style, cropping pattern, production and productivity that have brought an overall change in the agricultural scenario in the selected area of this study.

In this paper the change in area under food and non-food crops have been explained. In general, it has been observed that the area under food crops has decreased and area under categories of non-food crops has increased. The change in the cultivated area under the different crops of all selected sample districts of farmers is presented in the following table.

**Changes in Area under Food and Non-food Crops  
 (Year 2001 to 2017)**

S. N.	Sample District	Food Crops		Non-food Crops	
		2001	2017	2001	2017
1	Kolhapur	51.65%	37.94%	48.35%	62.06%
2	Solapur	52.88%	37.76%	47.12%	62.24%
3	Nagpur	46.37%	34.11%	53.63%	65.89%
4	Yavatmal	57.79%	34.42%	42.21%	65.58%

The change in cropping pattern has been studied in the research paper. Cereals, pulses, oilseeds and non-food crops are the broad categories of crops produce by the sample farmers. Cereals and pulses seem to be the most popular crops among the farmers but in recent year's farmers inclined towards to commercial crops or cash crops which are benefited to farmers.

From the above table following inferences can be drawn:

1. In the Kolhapur district, area under food crops was 51.65% in the year 2001 it has decreased upto37.84% in the year 2017. Regarding to the non-food crops, area under non-food crops has increased from 48.35% to 62.06% from the year 2001 to 2017. The cropping pattern has been changed from low value crops to high value crops. The area under food crops has decreased and non-food increased seen in under survey.
2. The area under food crops was 52.78% in the year 2001 it has decreased upto37.76% in the year 2017 in Solapur district. Regarding to the non-food crops, area under non-food crops has increased from 47.12% to 62.24% from the year 2001 to 2017. The cropping pattern has been changed from low value crops to high value crops.
3. In the Nagpur district, area under food crops was 46.37% in the year 2001 it has decreased upto34.11% in the year 2017. Regarding to the non-food crops, area under non-food crops has increased from 53.63% to 65.89% from the year 2001 to 2017. The cropping pattern has been changed from low value crops to high value crops. The area under food crops has decreased and non-food increased seen in under survey.
4. In the Yavatmal district, area under food crops was 57.79% in the year 2001 it has decreased upto34.42% in the year 2017. Regarding to the non-food crops, area under non-food crops has increased from 42.21% to 65.58% from the year 2001 to 2017. The cropping pattern has been changed from low value crops to high value crops. The area under food crops has decreased and non-food increased seen in under survey.
5. In general it has been seen that the cropping pattern changed from traditional crops to commercial one in the all sample district.

**Conclusion:**

In this research paper cropping pattern and its impact on agricultural development has been analyzed. Cereals, pulses, oilseeds and non-food crops are the broad categories of crops produce by farmers. Cereals and pulses seem to be the most popular crops among the farmers. Due to various tools used in agricultural sector more number of farmers is inclined towards non-food crops from food crops. The area under food crops has decreased and area under non-food crops has increased due to electrification. Now a day, numbers of farmers have started cultivation of vegetables, flowers, fruits and other commercial crops. Various tools have played an important role in shifting cropping pattern as well as increasing the level of income of farmers in the study area.

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## Impact of Canal Irrigation on Land Use Pattern in Sangli District of Maharashtra

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### **Introduction:**

*Maharashtra is one of the leading states in agriculture development in India. About 65 per cent of the total workers in the state depend on agriculture and allied activities. In Maharashtra western part of state is leading agricultural development sector. But agricultural development in western Maharashtra is uneven due to physical as well as socio-economic factors.*

**Objective:** To study the impact of canal irrigation on land use pattern in Sangli district.

### **Sample Villages :**

While studying the impact of river linkage on villages, the selection of villages were very complicated, however, the selection of Takari, Tembhu and Arphal lift project that links western part Krishna river to eastern parts Yerla and Nandani river has done. Total numbers of villages in link projects are '74' so that a stratified purposive sampling technique is used for collection of primary data from these villages to study the impact on agriculture. The selections of villages are based on the distance and height of villages from link river Yerla and Nandani. To select some case studies researcher has create parallel sectors of 2 km interval to Nandani and Yerla river from link starts up to confluence of Yerla and Krishna. Following villages are therefore, selected:

### **Landuse Pattern:**

Land resource is important because human economic and social development depend on such type of resources. Land use pattern is complex phenomena and interaction between physical, social and economic factors. Agricultural land is the main asset of rural settlement in study region. Existing land use pattern and its changing nature depend on economic factors, living standard, development of basic infrastructure and diffusion of new innovation and creativity. Land use pattern of sample villages is influenced by the physio-climatic factors such as slope, terrain, soil, precipitation and temperature. Another technological irrigation factor has caused tremendous change in the general land use pattern of case study areas. Before analysis of the agricultural pattern, it is necessary to study the change in general Land use pattern and its changing nature after linkage project.

National classification of Land use pattern has classified land among 12 categories but for present study researcher has studied these entire elements into six categories such as forest, cultivable waste, non agricultural uses, others fallows, current fallows and net sown areas. Table 1.1, 1.2 indicates that forest land is 2.16 per cent in sample villages and it is less than national and state average. But with comparison with 2001 forest cover is increased by 11.59 per cent because of irrigation people planted fruit plants on their farm. Proportion of forest occupied land is very less land with great differences from village to village. Two villages U'Mayani (5.50 %) and Shivani (4.97%) having more than average forest cover. The highest land under forest cover is observed in U'Mayani because of social forestry. But change in forest cover high recorded in Shivajinagar because of canal and minor irrigation projects. Lowest forest cover observed in Alsund (1.18) and rate of also change lowest. Another Shivajinagar (1.96 %), Rajapur (1.40%), Alate (1.35%) and Nimni (1.27 %) village's forest cover is less than average.

**Table1.1:Change in Landuse Pattern During 2001 to 2012(ha)**

Village	For est	Cultivable waste	Non Agricultural Uses	Other Fallows	Current Fallows	Net Sown Area	Total Area
<b>2001</b>							
U'Maya ni	94.53	156.60	18.00	245.00	352.00	685.49	1151.62
Shivajin agar	13.00	45.00	14.00	189.00	405.00	457.00	1123.04
Shivani	42.00	141.00	19.00	147.00	422.88	354.00	1125.88
Shirgaon	08.00	40.70	08.50	89.96	87.65	214.00	448.81
Rajapur	10.00	32.00	18.90	134.00	374.00	434.10	1003.00
Alte	12.00	36.00	21.00	186.00	85.00	546.00	886.00
Alsund	24.00	385.00	28.00	387.80	410.00	876.00	2110.80
Nimni	11.00	45.00	20.10	149.90	200.00	679.00	1105.00
Total	214.53	881.30	147.50	1528.66	2336.53	4245.59	8954.15
<b>2012</b>							
U'Maya ni	85.40	164.22	27.00	230.00	291.00	754.00	1151.62
Shivajin agar	22.00	48.04	182.00	126.00	243.00	502.00	1123.04
Shivani	56.00	144.20	82.00	39.08	92.60	712.00	1125.88
Shirgaon	11.00	42.70	40.00	09.30	12.00	348.00	448.81
Rajapur	14.00	35.00	35.00	107.00	174.00	638.00	1003.00
Alte	12.00	40.00	44.00	93.00	66.00	631.00	886.00
Alsund	25.00	394.70	79.00	286.10	210.00	1116.00	2110.80
Nimni	14.00	55.80	30.00	94.00	19.20	892.00	1105.00
Total	239.40	924.66	519.00	984.84	1107.80	5593.00	8954.15

Source: Based on Village Land Revenue Record, 2001, 2012.

Cultivable waste duly rocky land, steep slops, highly up and downs, area due to highly irrigation and nearly to canal is lightly changed. In 2001 cultivable waste land is 8.16 per cent in case study area. Change in the cultivable land is 4.92 per cent. Village Nimani (24.00 %) observed high change because of the irrigation low land becomes salty and water logged. The very low cultivable waste land (3.49 %) is found in Rajapur village. In another village its portion is 3 to 5 per cent.



Cultivable waste change is lightly increased because of Sagvan and Nilgiri plantation, area which is not available for irrigation development low production of food crops and lack of male farmer and labour.

Area under non agricultural uses in sample villages is 6.10 per cent. It mainly covers settlement, domestic animals shed, road etc. Its portion less in all villages but change is positive and highly recorded in Shivajinagar (1200 %) village because land utilized for Kadegaon industrial estates, newly settled dam affected settlement and Tembhu canal. Its change proportion is high in Shivani (331.00 %) and Shirgaon (370.59 %) villages more than average. Another U'Mayani ,Rajapur, Alte, Alsund and Nimni villages are below the average change. Change in non agricultural uses is positive because the new construction of houses and domestic animals sheds, land utilized for canal, new road constructed for sugarcane transportation are increased. It can be considered as positive indicator of economic progress of rural areas.

**Table1.2:Change in LandusePattern During 2001 to 2012(%)**

Village	Fore st	Cultivable waste	Non Agricultural Uses	Other Fallows	Current Fallows	Net Sown Area
<b>2001 (Pre Project)</b>						
U'Mayani	06.09	10.09	01.16	15.79	22.69	44.18
Shivajinagar	01.16	04.01	01.25	16.83	36.06	40.69
Shivani	03.73	12.52	01.69	13.06	37.56	31.44
Shirgaon	01.78	09.07	01.89	20.04	19.53	47.68
Rajapur	01.00	03.19	01.88	13.36	37.29	43.28
Alte	01.35	04.06	02.37	20.99	09.59	61.63
Alsund	01.14	18.24	01.33	18.37	19.42	41.50
Nimni	01.00	04.07	01.82	13.57	18.10	61.45
Average	02.16	08.16	01.67	16.50	25.03	46.48
<b>2012 (Post Project)</b>						
U'Mayani	05.50	10.58	01.74	14.82	18.75	48.59
Shivajinagar	01.96	04.28	16.21	11.22	21.64	44.70
Shivani	04.97	12.81	07.28	03.47	08.22	63.24
Shirgaon	02.38	09.22	08.64	02.01	02.59	75.16
Rajapur	01.40	03.49	03.49	10.67	17.35	63.61
Alte	1.35	04.51	04.97	10.50	07.45	71.22
Alsund	01.18	18.70	03.74	13.55	09.95	52.87

Nimni	01.27	5.05	02.71	08.51	01.74	80.72
Average	02.50	08.58	06.10	09.34	10.96	62.51
<b>Change in %</b>						
U'Mayani	-9.66	4.87	486.59	-6.12	-17.33	9.99
Shivajinagar	69.23	6.76	675.56	-33.33	-40.00	9.85
Shivani	33.33	2.27	226.95	-73.41	-78.10	101.13
Shirgaon	37.50	4.91	491.40	-89.66	-86.31	62.62
Rajapur	40.00	9.38	937.50	-20.15	-53.48	46.97
Alte	0.00	11.11	1111.11	-50.00	-22.35	15.57
Alsund	4.17	2.52	251.95	-26.22	-48.78	27.40
Nimni	27.27	24.00	2400.00	-37.29	-90.40	31.37
Average	11.59	04.92	251.86	-35.60	-52.59	31.73

Source: Based on Village Land Revenue Record, 2001, 2012.

Fallow land is also most important potential for agricultural extension. Fallow land is distributed into current fallow and other fallow. Before the canal and river linkage current fallow land was 25.03 per cent and other fallow land was 16.50 per cent. But after the project completion present per cent of current fallow land is 10.96 per cent observed -52.59 per cent negative change. Other fallow land change also recorded -35.60 per cent negatively because irrigation assurance. All villages record negative change in both current and other fallow land. This observed impact of link project. U'Mayani, Rajapur, Alte, Shivajinagar current fallow land percent is high because of economical problems marginal farmers can not lift water for irrigation from canal river.

Net sown area represents the actually sown area during the current agricultural calendar year. Net sown area percentage is 46.48 in 2001 and 2012 its percentage is 62.51 indicates positive change. There are five villages, which have net sown area above the study region while remaining three villages U'Mayani, Shivajinagar and Alsund have below the sample villages average. Change in net sown area is 101.13 per cent highest recorded at Shivani village because high benefit available of river linkage and canal irrigation. The net sown area is observed lowest in Shivajinagar (9.85 %) and U'Mayani (9.99 %) because of land utilization for another purpose and low assurance of irrigation in U'Mayani. Remaining other villages net sown area change is in between 15.57 to 62.62 per cent.

#### Conclusion:

General land utilization positively changes in forest, cultivable waste, non agricultural uses and net sown area. But change in fallow land is negative indicates the irrigation development positively affected. Moreover, expansion is also possible by cultivating the land more than once year.

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## Role of DCCBs in Maharashtra

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### 1. Introduction:

District Central Cooperative Bank is the institutions providing short term credit to the agriculturists vi societies. The central Banks act as an intermediary to link the primary societies with money market. They serve as the balancing central for adjusting the surplus and deficiency of working capital of the primary societies. District Central Cooperative Bank occupy a significant position in the cooperative credit structure. The success of the cooperative credit movement largely depends on their financial strength. Membership of the DCCBs is open both the cooperative credit societies as well as to the marketing societies, consumer stores, farming societies and urban cooperative societies.

Generally DCCBs advance loans to primary credit societies to finance agricultural and rural development. DCCBs bank provides short term as well as medium term loans.

### 2. Objective of the Study

1. To study the deposits mobilization of DCCBs in Maharashtra.
2. To study the issued short term and medium term loans by DCCBs in Maharashtra.
3. To Study the percentage share of short term loans in total loans
4. To study the share of medium term loans in total loans.

### 3. Data Collection:

The present study is based on secondary data. Secondary data has been collected from [www.nascob.org](http://www.nascob.org) websites. For the study, simple growth rate and percentage tool has been used.

## 4. Role of DCCBs in Maharashtra

### 4.1 Membership

All registered cooperative societies within district are eligible for membership. The membership of the DCCBs generally consists of primary societies registered with the area of operation of the bank and the individual. Membership of DCCBs is open to agriculture credit societies as well as marketing societies, consumer cooperative societies, industrial cooperative societies, processing cooperative societies, urban cooperative banks. Any individual person who is resident of district may be admitted as nominal member. The membership of cooperative societies was 93893 in 2004-05 which increased 109339 in 2016-17. The individual membership increased from 20219 to 21247 during study period.

### 4.2 Branch Network:

Branch expansion is the most important instrument for deposits mobilization for any bank and cooperative banks no exception. During the 2004-05 to 2016-17, branches of DCCBs in Maharashtra was more than 3677. The branches of DCCBs in Maharashtra has spread all over districts so that DCCBs in Maharashtra could collect different types deposits from urban and rural areas and provide different types of credit to a large number of borrowers.

### 4.3 Deposits Mobilization

The DCCBs collect deposits from urban and rural areas. The DCCBs collect various types deposits like current deposits, saving deposits, fixed deposits and other deposits. The size and types wise composition of bank deposits is illustrated in the table no. 1.

**Table No. 1.**  
**Types wise deposits of DCCBs in Maharashtra**

Year	Current Deposits	Saving Deposits	fixed Deposits	Total Deposits	SGR
2004-05	354531 (14.39%)	549159 (22.29%)	1560402 (63.33%)	2464092 (100%)	
2005-06	390445 (14.40%)	669953 (24.71%)	1651068 (60.89%)	2711466 (100%)	10.03
2006-07	441901 (16.20%)	752280 (27.59%)	1532945 (56.21%)	2727126 (100%)	0.57
2007-08	500345 (15.91%)	920941 (29.28%)	1724171 (54.81%)	3145457 (100%)	15.33
2008-09	671318 (18.03%)	1105414 (29.70%)	1945785 (52.27%)	3722517 (100%)	18.34
2009-10	709863 (16.29%)	1371721 (31.48%)	2275759 (52.23%)	4357343 (100%)	17.05
2010-11	801582 (17.12%)	1581274 (33.78%)	2298510 (49.10%)	4681366 (100%)	07.43
2011-12	897701 (19.30%)	1697157 (36.49%)	2056461 (44.21%)	4651319 (100%)	-0.65
2012-13	905776 (25.21%)	178093 (4.96%)	2508571 (69.83%)	3592440 (100%)	-22.27
2013-14	1010198 (18.18%)	1896084 (34.13%)	2649871 (47.69%)	5556153 (100%)	54.66
2014-15	733261 (9.09%)	2132226 (26.44%)	5197980 (64.46%)	8063467 (100%)	45.12
2015-16	1014450 (15.34%)	2310932 (34.95%)	3287612 (49.71%)	6612994 (100%)	17.99
2016-17	1020163 (14.49%)	2450712 (34.81%)	3568471 (50.69%)	7039346 (100%)	6.44

Source : [www.nafscob.org](http://www.nafscob.org)

Table no. 1 shows types wise deposits of DCCBs in Maharashtra. The current deposits are low cost deposits. The current deposits increased from Rs.354531 lakh to Rs.1020163 lakh. The percentage share of current deposits in total deposits ranged between 9.09% to 25.21% during 2004-05 to 2016-17. The saving deposits are other low cost deposits compare to fixed deposits. The highest percentage share of saving deposits in total deposits was 36.49% in 2011-12 and lowest share of saving deposits in total deposits 4.96 in 2012-13. The percentage share of fixed deposits to total deposits ranged between 44.21% to 69.83% during 2004-05 to 2016-17. The annual growth rate of total deposits ranged between -22.27 to 54.66 during 2004-05 to 2016-17.

#### 4.4 Short term loan issued for agriculture and non-agriculture

The DCCBs issued short term loans to cooperative societies to finance agricultural and non-agriculture activities. The DCCBs issued short term loan for seasonal agricultural operations. The short term loans are generally made for 12 months. The DCCBS has advanced loans mainly for non-agricultural purpose to the salaried class, petty trader, consumer durable loans, gold loan, vehicle loans and housing loans.

**Table no. 2**  
**Short term loan issued for agriculture and non-agriculture**

Year	Agricultural short Term Loan	Non-agricultural Short term Loan	Total short term loans	SGRM
2004-05	319880 (33.86%)	624733 (66.13%)	944613 (100%)	
2005-06	388443 (38.84%)	611567 (61.15%)	1000010 (100%)	5.8645
2006-07	477437 (39.94%)	717786 (60.05%)	1195223 (100%)	19.521 1
2007-08	582145 (39.46%)	893094 (60.53%)	1475239 (100%)	23.427 9
2008-09	441743 (34.49%)	839008 (65.50%)	1280751 (100%)	-13.19
2009-10	834855 (47.58%)	919618 (52.41%)	1754473 (100%)	36.98
2010-11	969086 (51.15%)	925254 (48.84%)	1894340 (100%)	7.97
2011-12	1138302 (49.91%)	1142090 (50.08%)	2280392 (100%)	20.37
2012-13	1337314 (42.99%)	1773220 (57%)	3110534 (100%)	36.40
2013-14	1362267 (53.92%)	1163972 (46.07%)	2526239 (100%)	-18.79
2014-15	1558138 (47.04%)	1753883 (52.95%)	3312021 (100%)	31.10
2015-16	1626118 (48.04%)	1758586 (51.95%)	3384704 (100%)	2.19
2016-17	1540000 (40.96%)	2219662 (59.03%)	3759662 (100%)	11.07

Source : [www.nafscob.org](http://www.nafscob.org)

Table no. 2 reveals short term loan issued for agriculture and non-agriculture. The DCCBs short term loan issued increased from Rs.944613lakh to Rs.3759662lakh. The annual growth rate of short term loans issued was fluctuated between -18.79 to 36.98 during 2004-05 to 2016-17. The DCCBs provides short term loan for agriculture and non-agricultural RS. 319880lakh and Rs. 624733lakh respectively in 2004-05 which increased to Rs. 540000 lakh and Rs.2219662 lakh. The percentage share of short term agricultural loans and non-agriculture loans ranged between 33.86% to 51.15% and 46.06% to 66.13% respectively during 2004-05 to 2016-17.

#### 4.5 Loan issued- Medium Term Agriculture and Non-agriculture

The DCCBs gives the short term and medium term loan to cooperative societies. The medium term loan is given for agricultural purposes and non-agriculture purpose. The medium term loan is given to agriculture purposes such as for purchase livestock, bonding and other land improvement and repairs of agriculture implements, machinery, transport equipment, farm hours and cattle shade. The DCCBs give the medium term loan to non-agricultural purpose for purchase construction and repairs of residential house, expenses relating to death and marriage and other ceremonies and irrigation expenses.



**Table no. 3**  
**Loan issued- Medium Term for Agriculture and Non-agriculture**

Year	Agricultural loan	Non-agricultural loan	Total medium term loan	SGR
2004-05	194145 (80.42%)	47261 (19.57%)	241406 (100%)	
2005-06	94755 (57.53%)	69922 (42.46%)	164677 (100%)	-31.79
2006-07	446813 (69.63%)	194810 (30.36%)	641623 (100%)	89.62
2007-08	44441 (30.75%)	100054 (69.24%)	144495 (100%)	-77.48
2008-09	42032 (26.81%)	114692 (73.18%)	156724 (100%)	8.46
2009-10	85862 (41.70%)	120029 (58.29%)	205891 (100%)	31.37
2010-11	142043 (48.54%)	150578 (51.45%)	292621 (100%)	42.12
2011-12	130890 (45.15%)	158955 (54.84%)	289845 (100%)	-0.95
2012-13	86332 (34.41%)	164519 (65.58%)	250851 (100%)	-13.46
2013-14	76809 (23.12%)	255370 (76.87%)	332179 (100%)	32.42
2014-15	164835 (39.32%)	254355 (60.67%)	419190 (100%)	26.19
2015-16	159325 (32.20%)	335391 (67.79%)	494716 (100%)	18.01
2016-17	157615 (5.78%)	2566414 (94.21%)	2724029 (100%)	50.62

Source : [www.nafscob.org](http://www.nafscob.org)

Table No.3 shows that the DCCBs in Maharashtra has issued medium term loan Rs. 241406 lakh in 2004-05 which increased to Rs.2724029 in 2016-17. The highest simple growth rate was registered 89.62 in 2005-16 and the lowest simple growth rate-77.48 in 2007-08 .The percentage share of loan issued medium term for agricultural in total medium term ranged between 5.78% to 80.12% . The Lowest percentage share of loan issued medium term for non-agricultural purpose was 19.57% in 2004-05 and the highest was 94.21 % in 2016-17.

#### 4.6 Total Loan issued

Short term agricultural and Non-agricultural loan, medium term agricultural and non-agricultural and other loan are included in total loan issued.

**Table No. 4**  
**Total loan issued**

Year	Short Term loan issued	Medium Term loan issued	Other loan issued	Total loans	SGR
2004-05	944613 (67.63%)	241406 (17.28%)	210735 (15.09%)	1396754 (100%)	
2005-06	1000010 (69.98%)	164677 (11.52%)	264395 (18.50%)	1429082 (100%)	2.312

2006-07	1195223 (55.22%)	641623 (29.64%)	327641 (15.14%)	2164487 (100%)	51.45 2
2007-08	1475239 (77.86%)	144495 (7.63%)	275014 (14.51%)	1894748 (100%)	- 12.47
2008-09	1280751 (77.70%)	156724 (9.51%)	210816 (12.79%)	1648291 (100%)	- 13.01
2009-10	1754473 (78.76%)	205891 (9.24%)	267315 (12.00%)	2227679 (100%)	35.15
2010-11	1894340 (71.08%)	292621 (10.98%)	477962 (17.94%)	2664923 (100%)	19.62
2011-12	2280392 (71.94%)	289845 (9.14%)	599582 (18.92%)	3169819 (100%)	18.94
2012-13	3110534 (78.80%)	250851 (6.36%)	585873 (14.84%)	3947258 (100%)	24.52
2013-14	2526239 (73.82%)	332179 (9.71%)	563645 (16.47%)	3422063 (100%)	- 13.31
2014-15	3312021 (81.25%)	419190 (10.28%)	345308 (8.47%)	4076519 (100%)	19.12
2015-16	3384704 (81.70%)	494716 (11.94%)	263485 (6.36%)	4142905 (100%)	1.62
2016-17	3759662 (55.36%)	2724029 (40.11%)	308172 (4.54%)	6791863 (100%)	63.93

Source : [www.nafscob.org](http://www.nafscob.org)

Table No. 4 shows Total loan issued by DCCBs in Maharashtra was Rs. 1396754 lakh in 2004-05 which increased Rs. 6791863 lakh in 2016-17. The percentage share of short term loan issued in total loan issued by DCCBs in Maharashtra and percentage share of medium loan in total loan ranged between 55.22% to 81.70 and 6.36% to 40.11% respectively during 2004-05 to 2016-17. The percentage share of other loan in total loan was less than 18.50%. In Short, more short term loan have been given for agriculture and non-agriculture purpose by DCCBs in Maharashtra.

#### 4.7 Kisan Credit Card

The Kisan Credit Card (KCC) programme was launched by the NDA government in 1998. With this scheme, the government aimed to fulfil timely and short-term credit needs of the farmers of India during the planting and harvesting season. Kisan Credit Cards are offered by cooperative banks, public sector banks, and regional rural banks. The DCCBs in Maharashtra issued loan Rs. 1027533 lakh through 3026705 Kissan Credit cards in 2012-13 and Rs. 1085020 lakh through 2647065 Kissan Credit Cards in 2016-17.

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## **A Study Of Environmental Attitude Among Undergraduate Students In Relation To Their Gender And Academic Stream**

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### **Introduction:**

Environment is an indicator of national health. Environmental attitude means how the students express their feelings, acting and giving opinion about environment. It's a duty of every student to develop the positive attitude towards environment. Every student have acquire the better knowledge about environment where they are living. The students develop friendly relationship with environment and protect the environment. Environmental degradation is emerging/serious issue in India as well as in the world today. Today's human is largely responsible for this degradation. So, there is a need to pay serious attention towards protecting environment. Our government is trying various efforts for it. According to UNESCO (2005), the role of education is more important for shaping, attitudes, values and behavior towards environment. Environmental education is a process that creates awareness about environment and understand the relationship between human being and environment.

Environment is the most powerful factor which determines our lifestyle. Environment has influenced and shaped our lives. Environmental factors influences human being. All of the human development and growth influences the environment. Instead of environment human life is totally impossible. But in present condition we have been seeing a different picture. The status of environment is decreasing day by day. Environmental degradation is a very crucial issue of world. Today, it's a need to urgent intervention. In 21<sup>st</sup> century, the environmental issues, problems and challenges have been worrying consequences of environmental pollution. The world is facing various environmental problems such as climate change, decreasing level of ozone, global warming. The school and colleges are important in contributing to students understanding of the environmental issues. Environmental degradation is a prime problem in rural as well as in urban. So, it is need to provide environmental literacy level among students. Research study of Singh (1970) – The girl Students had stronger knowledge and attitude than boys towards environmental factors.

Environmental attitude is one of the most important factor which is positively affected on environmental behavior. Environmental attitude have been defined as “the collection of beliefs, affects and behavioral intentions a person holds regarding environmentally related activities or issues” (Schultz et al., 2004). Environmental attitude is more or less permanent enduring state of readiness or mental organization which predisposed an individual to react in a characteristic way to any subject or situation with which it is related.

### **Review of Literature:**

#### **Bhardwaj and Behal(2011)**

conducted a study on “A study of environmental awareness and attitude among college students of Delhi.” In this study the objectives were as follows

1. To study the level of student's awareness about environment
2. Find out the relationship between student's environmental awareness and attitude
3. To examine the difference in students' awareness and attitude about environment based on: gender, level and academic stream.

The sample was 100 students (50 boys and 50 girls) for present study. This was selected by using simple random sampling technique. The result reveals that overall awareness was moderate and

environmental attitude was high. So, there was no significant difference found between gender towards environmental awareness and environmental attitude. The positive significant relationship found between environmental awareness and attitude of students. It shows that the students having more awareness and attitude towards environment. There was significant difference found between different academic stream of students towards environmental awareness and attitude. Especially Science students had more awareness and positive attitude about environment. So, there was found the significance difference between undergraduate and postgraduate students about environmental awareness and attitude.

**Heyl.M., Moyano.E.(2013)**

undertook the study on environmental attitudes and behaviors of college students. The main focus of his research was to study the influence of gender and class from engineering students on environment attitude and pro-environmental behaviors. The sample was 383 students. The results showed that the engineering students have positive attitude towards environment and the pro-environmental behavior showed averagely positive.

**Karahuseyinoglu. (2013)**

conducted a study on university students' athlete's attitudes towards environment in Turey. The main objective of his study was to study attitudes towards environment of university athlete's students. The sample was consists 304 for the study. The random sampling technique was used for selection of the data. The results indicated that female sports students had higher environmental attitude than male sports students.

**Need and Importance of the Study:**

Students have played an important role in the activities about environmental attitude and awareness. Young generation especially teenagers will determine the future of environment in India. Environmental attitude among the students is highly influenced by their knowledge, background and attitude towards the environment. Students are backbone of the nation. They have power to change the future of the society. But, unfortunately today we see the today's youth are mostly interested in other activities which are not useful to them as well as to nation. They are involving their valuable time in unnecessary work such as taking drugs and playing video games, etc.

The problem of environment is very crucial. It is not possible to face by government alone. It is the duty of all factors of human being such as organizations, schools, colleges to fight with the problems of environment. Students are important factor for it. Student can change the face of environment, but its need of building attitude of students towards these problems. Students can take a responsibility to protect environment by taking practical actions. Students can play an active role in protecting and improving the environment. Students are a midpoint to create interaction between environment and society. They can influence their parents, friends and relatives towards protection of environment. The present study as an attempt of to create awareness and attitude among college students which can help to protect our environment and our lives.

**Statement of the Problem:**

“A study of environmental attitude among undergraduate students in relation to their gender and academic stream”

**Objective of the Study:**

The following objectives were presents research study-

1. To study the level of environmental attitude among B.Sc. male and female undergraduate students.
2. To study the level of environmental attitude among B. A. male and female undergraduate students.
3. To study the level of environmental attitude among B.Sc. and B. A. male undergraduate students.
4. To study the level of environmental attitude among B.Sc. and B. A. female undergraduate students.

**Hypotheses:**

The following hypotheses were presents research study-

1. There is a significance difference in level of environmental attitude among B.Sc. male and female undergraduate students.
2. There is a significance difference in level of environmental attitude among B. A. male and female undergraduate students.
3. There is a significance difference in level of environmental attitude among B.Sc. and B. A. male undergraduate students.
4. There is a significance difference in level of environmental attitude among B.Sc. and B. A. female undergraduate students.

**Methodology:-**

1. **Sample:-** The sample of the present study was collected from the Arts and Science undergraduate students of different colleges of Kolhapur city. The total participants were 80 from different colleges of Kolhapur city. In that, 40 male and 40 female were Arts undergraduate students and 40 male and 40 female were Science undergraduate students. The accidental sampling technique was used for selecting the subjects.

2. **Variables:-** Independent Variable - 1. Male and female Arts undergraduate students  
 2. Male and female Science undergraduate students

Dependent Variables- Level of Environment attitude

**3. Tools:-**

The following standardized psychological test used to collect the data.

**I. Taj Environmental Attitude Scale (TEAS):**

This scale is developed by Dr. HaseenTaj(2001). TEAS consisted of 61 items. These items spread over six areas. Each item has two alternative responses. The reliability of the scale was estimated by two methods. Split half reliability is 0.51 and test-retest reliability coefficient is 0.60.

4. **Statistical Analysis:-** Mean, SD and t value were used for the analysis of collected data.

5. **Result and Discussion:-**

**Table No.1**

**Showing Mean, SD and ‘t’ value of B.Sc. male and female undergraduate students**

Factor	N	Mean	SD	df	‘t’ value
Male students	40	167.83	10.72	78	0.35***
Female students	40	166.95	8.17		

\*significant at 0.01 level, \*\*significant at 0.05 level, \*\*\* not significant

The table no. 1 shows that the mean score of B.Sc. male undergraduate students 167.83 (SD = 10.72) is more than mean score of female undergraduate students 166.95 (SD = 8.17). The obtained t value is 0.35 which is statistically not significant at 0.05 level. So, it is clear that there is no significant difference in level of environmental attitude among B.Sc. male and female undergraduate students.

**Table No.2**

**Showing Mean, SD and ‘t’ value of B. A. male and female undergraduate students**

Factor	N	Mean	SD	df	‘t’ value
Male students	40	165.17	9.45	78	0.32***
Female students	40	164.25	9.41		

\*significant at 0.01 level, \*\*significant at 0.05 level, \*\*\*not significant

The table no. 2 shows that the mean score of B. A. male undergraduate students 165.17 (SD = 9.45) is more than mean score of female undergraduate students 164.25 (SD = 9.41). The obtained t value is 0.32 which is statistically not significant at 0.05 level. So, it is clear that there is no significant difference in level of environmental attitude among B. A. male and female undergraduate students.

**Table No.3**  
**Showing Mean, SD and ‘t’ value of male undergraduate students**

Factor	N	Mean	SD	df	‘t’ value
B.Sc. male students	40	167.83	10.72	78	0.08***
B. A. male students	40	165.17	9.45		

\*significant at 0.01 level, \*\*significant at 0.05 level, \*\*\* not significant

The table no. 3 shows that the mean score of B.Sc. male undergraduate students 167.83 (SD = 10.72) is more than mean score of B. A. male undergraduate students 165.17 (SD = 9.45). The obtained t value is 0.08 which is statistically not significant at 0.05 level. So, it is clear that there is no significant difference in level of environmental attitude among B.Sc. male and B. A. male undergraduate students.

**Table No.4**  
**Showing Mean, SD and ‘t’ value of female undergraduate students**

Factor	N	Mean	SD	df	‘t’ value
B.Sc. female students	40	166.95	8.17	78	0.08***
B. A. female students	40	164.25	9.41		

\*significant at 0.01 level, \*\*significant at 0.05 level, \*\*\* not significant

The table no. 3 shows that the mean score of B.Sc. female undergraduate students 166.95 (SD = 8.17) is less than mean score of female undergraduate students 164.25 (SD = 9.41). The obtained t value is 0.08 which is statistically not significant at 0.05 level. So, it is clear that there is no significant difference in level of environmental attitude among B.Sc.female and B. A. female undergraduate students.

**Conclusion:-**

1. Reference to table no. 1 there is no significant difference in level of environmental attitude among B.Sc. male and female undergraduate students.
2. Reference to table no. 2 there is no significant difference in level of environmental attitude among B. A. male and female undergraduate students.
3. Reference to table no. 3 there is no significant difference in level of environmental attitude among B.Sc. male and B. A. male undergraduate students.
4. Reference to table no. 4 there is no significant difference in level of environmental attitude among B.Sc. female and B. A. female undergraduate students.

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## Sugarcane Cultivation and Production in Dharwad District: A Geographical Study

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### Abstract

*Adoption of the improved technology is the ultimate aim of the social scientists for enhancing the area and production and income of the farming system. This study was conducted in Dharwad district of Karnataka during 2005-06 to 2014-15. The study revealed that majority of sugarcane growers had poor adoption level about green manure application, soil testing, bio-fertilizer application, seed treatment, disease management and Integrated pest management. Thus, the study suggests for immediate attention of the extension functionary for convincing the sugarcane growers which would result in the higher adoption and income. Cropping pattern in the 5 taluks of Dharwad district indicates that this sugarcane crop is given little or marginal attention by the farmers in four taluks of Dharwad, Hubli, Kalaghatagi and Kundagol, while farmers in Navalgund taluk have devoted maximum area under this sugarcane crop during the decade from 2005-06 to 2014-15. The advantage of irrigation and the soil and topography seem to have influenced high priority for growing sugarcane crop in Navalgund taluk. There is need for a proper crop planning for sugarcane by farmers in the other four taluks as sugarcane has gained more importance by the domestic users in recent years. Scientific planning of farming and provision of needed farm inputs by the concerned agencies would be helpful in expansion of cropped area in the taluk areas in Dharwad district.*

*Objective: To analyse the agro-climatic conditions in the sugarcane cultivation and Production in Dharwad District.*

**Key words:** Sugarcane production; Sugarcane growth;

### Introduction

Sugarcane (*Saccharum officinarum*L.) is an important commercial crop of the world and is cultivated in about seventy five countries, the leading countries being India, Brazil, Cuba, Mexico and Thailand. The sugar industry plays an important role in the agricultural economy of India. Today sugarcane cultivation and sugar industry stands as supporting pillars of Indian economy. India occupies the second rank in production of sugarcane in the world. The area under sugarcane in India is 5.03 million hectares during the year 2011-12 and cane production of 342.20 million tonnes and productivity is 68.09 metric tonnes per ha. (Directorate of Economics and Statistics, Department of Agriculture and Cooperation, GOI).

The discussion in this research paper is focused on the analysis of Sugarcane cropping pattern in the study area of Dharwad district and in the 5 taluks of Dharwad, Hubli, Kalaghatagi, Kundagol and Navalgund. The cropwise analysis of the area under the major crop has been made for a period of ten years from 2005-06 to 2014-15. The detailed analysis covered cropped area under commercial crops selected for the study. The analysis has revealed significant trends regarding the changes in the area under these crops. The variations in the area under the sugarcane crops and the production of the sugarcane has been analysed taking into account the natural factors like the soil, rainfall, climate and the topography in addition to the economic considerations like price, income, demand and other related factors influencing the cropping pattern in the study areas of the district and the taluks. The district is largely agricultural oriented. The analysis of the cropping of these major agricultural products covers changing cropped area during a period of one decade from 2005-06 to 2014-15, the first decade of the new millennium. The changing cropped area during the decade indicates the significance of the crops in terms of the prices, income and other factors influencing the variations in the cropping pattern.

**Objective :**

The broad objective of the present study is to examine in depth the geographical problems of sugarcane cultivation in Dharwad District and also the prospects for future development in sugarcane cultivation. The specific objects of this research program are :

- i. To analyse the agro-climatic conditions in the sugarcane cultivation.
- ii. To investigate the factors responsible for growth and development of sugarcane cultivation and Production in the District.
- iii. To examine the capability of land for sugarcane cultivation and Production in Dharwad district.

**Methodology :**

The study is based on primary and secondary data from different sources. Primary data is based on actual survey and questionnaire and discussion with respondents concerned with sugarcane cultivation. Secondary data is collected from published material by Government, Semi-Government and private organizations, institutions, offices etc. A random sample survey has been conducted by selection of one village in the district of sugarcane growing region. As well as survey has been conducted in one of the Agricultural Research Station which is specially concentrated only on sugarcane crop.

**Location And Study Area :**

Dharwad district is well known for its varied agro-climatic regions, diversified soil type and cropping pattern. In Dharwad all the crops which are cultivated in different districts of Karnataka are found so it was selected purposively for the present study.

Dharwad district falls in the Northern part of Karnataka between 15° 15' and 15°35' 15 N latitude and 75° 00' and 75° 20' E longitudes, in the Northern Dry Zone (Zone 3) and Northern Transitional Zone (Zone 8). It is bound on the North by Belgaum district, on the South by Haveri district, on the East by Gadag district and on the West by Uttara-Kannada district. It consists of five taluks viz; Dharwad, Hubli, Kalghatgi, Kundgol and Navalgund. The district has area of 4260 Km<sup>2</sup> constituting about 2.22 per cent of the state area.

**Demographic features of the study area**

The population of the Dharwad district was 1846993 (2010 census) with per square kilometer population density of 377. Sex ratio of the district was 949 (Number of females per 1000 males). Out of the total population 71.6 per cent was literate. District consisted of 25.8 per cent cultivators, 27.3 agricultural labors, 2.9 per cent household industries and 44.1 other workers.

**Climate, rainfall and soil type**

The soils of the district are predominantly red loams with patches of black soils. Red soils are well drained and range from red to pace brown in colour. The district generally has a humid and dry climate with the normal rainfall of 786 mm per annum

The agricultural seasons in the district can be broadly classified into *Kharif* and *Rabi* seasons. *Kharif* season commences in May-June and ends in September. *Rabi* season starts in the month of September – October and ends in February. The total net sown area of the district is as much as 3,10,816 ha of which 15,745 was irrigated. The major crops grown, based on their highest area under cultivation are Cotton, Sunflower, Sugarcane *etc.*

**Land utilization pattern**

Total geographical area of Dharwad district was 4,27,329 ha out of this 35,235 ha covered by forest, 26,042 ha land was not available for cultivation, 48,279 ha was fallow land and total net sown area was 3,10,816 ha.

**Results And Discussion****Area Under Sugarcane In Dharwad Taluk**

Dharwad taluk has relatively more area under Sugarcane compared to other 4 taluks in Dharwad district. There is a trend of increase in the area under Sugarcane in the taluk though with

some fluctuations during the intervening period. The total area under Sugarcane in Dharwad taluk ranged between a minimum of 1652 hectares in 2009-10 and a maximum of 4967 hectares in 2012-13. Maximum increase in area under Sugarcane was 78.94 percent in 2012-13 over the previous year and maximum decrease in the area under Sugarcane was -52.67 percent in 2004-05 over the previous year. Minimum production of sugarcane in Dharwad taluk is 66080 tonnes in 2009-10 and maximum was 198680 tonnes in 2012-13. The sugarcane production increased 79% from the previous year. The following table provides the details.

**TABLE-1 Area Under Sugarcane in Dharwad Taluk 2005-06 to 2014-15**

Year	Area in Hectares	Percentage of increase or Decrease	Annual Growth rate (+ or -)	Production in Tonnes
2005-06	3141	-	-	125640
2006-07	2675	14.83	-	107000
2007-08	3315	23.92	+	132600
2008-09	3491	5.3	+	139640
2009-10	1652	52.67	-	66080
2010-11	2185	32.26	+	87400
2011-12	3910	78.94	+	156400
2012-13	4967	27.03	+	198680
2013-14	2909	41.43	-	116360
2014-15	4395	51.08	+	175800

Source : district as glance, department of statistics dharwad

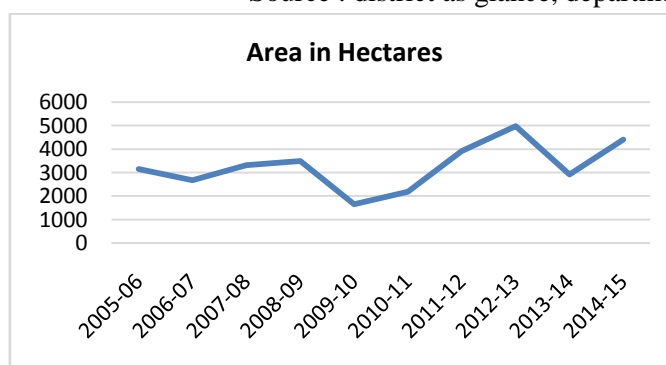


Fig 1. Shows the sugarcane area in hectares for Dharwad Taluk

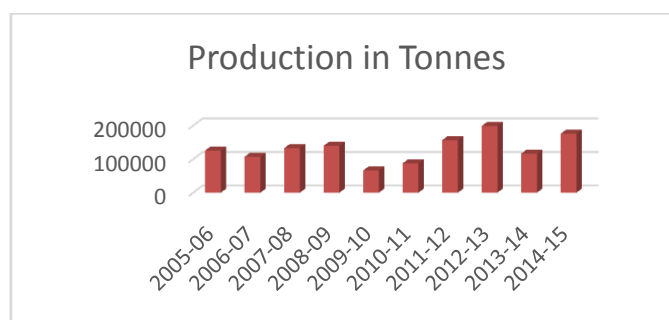


Fig 2. Shows the sugarcane Production in tonnes for Dharwad Taluk

### Area Under Sugarcane In Navalgund Taluk

There has been a gradual increase in the area under Sugarcane in Navalgund taluk during the 10 years from 2005-06 to 2014-15. The total area under Sugarcane was low at 1hectares in 2010-11 but rose steeply to 72 hectares in 2014-15 and stood at 63 hectares in 2014-15. The area decreased under Sugarcane during 2007-08 (-.25%), 2008-09 (-33.33%), in 2009-10 (-85.71%) and in 2014-15 (-12.5%). Minimum production of sugarcane in Navalgund taluk was 60 tonnes in 2010-11 and Maximum production was 2880 tonnes in 2013-14. The following table provides the details.

**TABLE-2 Area Under Sugarcane in Navalgund Taluk 2005-06 to 2014-15**

Year	Area in Hectares	Percentage of increase or Decrease	Annual Growth rate (+ or -)	Production in Tonnes
2005-06	5	-		200
2006-07	8	60	+	320
2007-08	6	25	-	240
2008-09	4	33.33	-	160
2009-10	7	75	+	280
2010-11	1	85.71	-	60
2011-12	4	30.0	+	160
2012-13	25	52.5	+	1000
2013-14	72	18.8	+	2880
2014-15	63	12.5	-	2520

Source: District at a Glance, Department of Statistics Dharwad

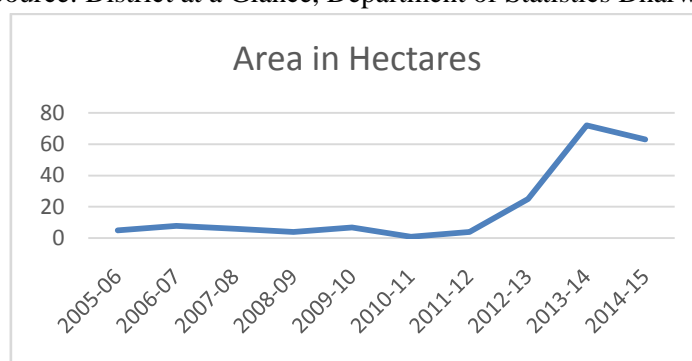


Fig 3. Shows the sugarcane area in hectares for Navalgund Taluk

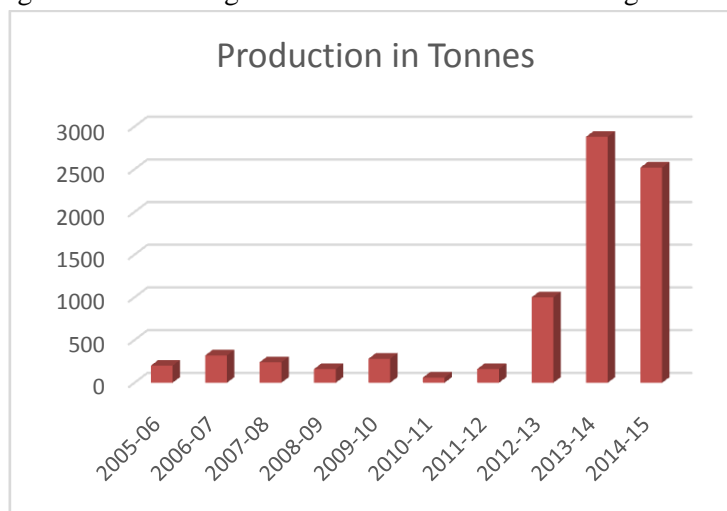


Fig 4. Shows the sugarcane Production in tonnes for Navalgund Taluk

### Area Under Sugarcane In Hubli Taluk

The area under Sugarcane in Hubli taluk ranged between a minimum of 18 hectares in 2006-07 and a maximum of 116 hectares in 2012-13. The area under Sugarcane in Hubli taluk has indicated a trend of fluctuations from year to year. Maximum increase in the area under Sugarcane was 33.88 percent in 2007-08 over the previous year and maximum decrease in the area under Sugarcane was 75.67 percent in 2006-07. Minimum production of sugarcane in Hubli taluk was 720 tonnes in 2006-07 and maximum production was 4872 tonnes in 2012-13. The following table provides the details.

**TABLE-3 Area Under Sugarcane in Hubli Taluk 2005-06 to 2014-15**

Year	Area in Hectares	Percentage of increase or Decrease	Annual Growth rate (+ or -)	Production in Tonnes
2005-06	74	-		2960
2006-07	18	75.67	-	720
2007-08	79	33.888	+	3160
2008-09	72	8.86	+	2880
2009-10	61	15.27	-	2440
2010-11	43	29.5	-	1720
2011-12	99	13.23	+	4158
2012-13	116	17.17	+	4872
2013-14	84	27.58	-	3528
2014-15	70	16.66	-	2940

Source: District at a Glance, Department of Statistics Dharwad

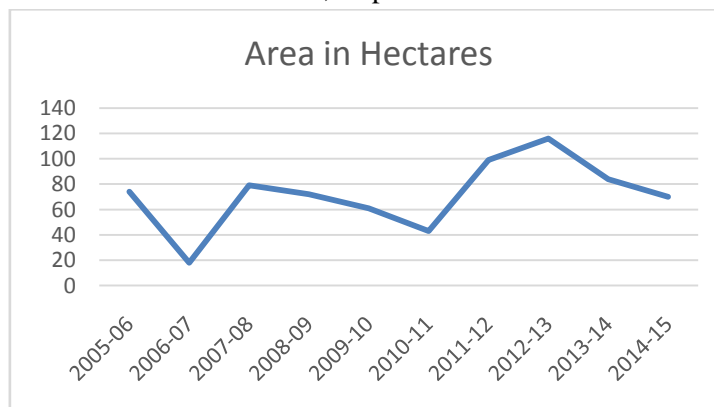


Fig 5. Shows the sugarcane area in hectares for Hubli Taluk

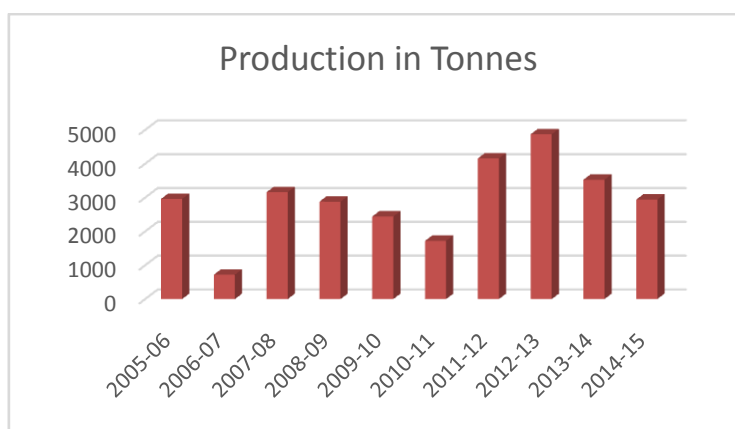


Fig 6. Shows the sugarcane Production in tonnes for Hubli Taluk

### Area Under Sugarcane In Kalaghatagi Taluk

Kalaghatagi taluk has maximum area under Sugarcane next only to Dharwad taluk. Maximum area under Sugarcane in the taluk was during 2011-12 to 2012-13. Total area under Sugarcane ranged between a minimum of 87 hectares in 2014-15 and a maximum of 1494 hectares in 2012-13. Maximum increase in area under Sugarcane in the taluk was 71.64 percent in 2011-12 over the previous year. Maximum decline in the area under Sugarcane was -91.84 percent in 2014-15. Minimum production of sugarcane was 3654 in 2014-15 and Maximum production of 62748 tonnes in 2012-13. The following table provides the details.

**TABLE-4 Area Under Sugarcane in Kalaghatagi Taluk 2005-06 to 2014-15**

Year	Area in Hectares	Percentage of increase or Decrease	Annual Growth rate (+ or -)	Production in Tonnes
2005-06	291	-		11640
2006-07	175	39.86	-	7000
2007-08	166	5.14	-	6640
2008-09	247	48.79	+	10374
2009-10	305	23.48	+	12810
2010-11	402	31.8	+	16884
2011-12	1092	71.64	+	45864
2012-13	1494	36.81	+	62748
2013-14	1067	28.58	-	44814
2014-15	87	91.84	-	3654

Source: District at a Glance, Dept. Of Statistics Dharwad

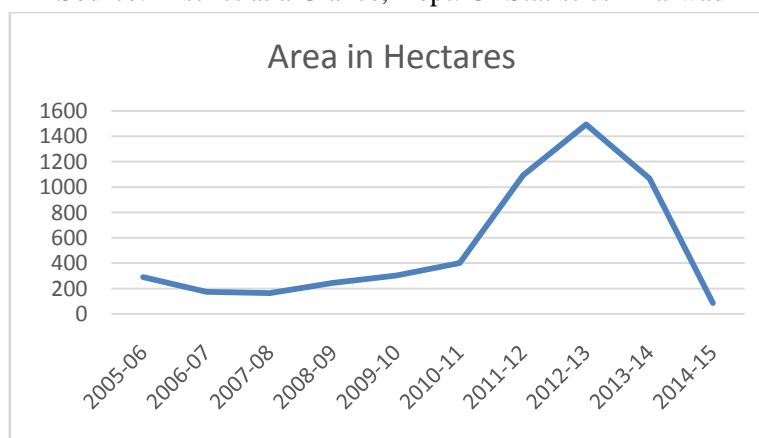


Fig 7. Shows the sugarcane Area in hectares for Kalaghatagi Taluk

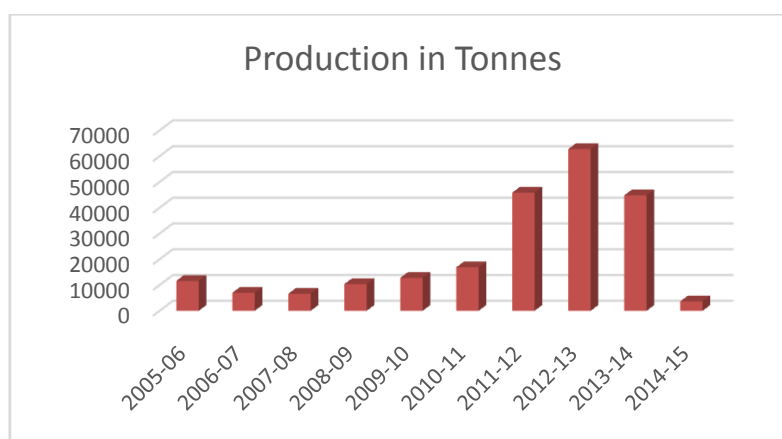


Fig 8. Shows the sugarcane Production in tonnes for Kalaghatagi Taluk



## Conclusion

Cropping pattern in the 5 taluks of Dharwad district indicates that this sugarcane crop is given little or marginal attention by the farmers in four taluks of Dharwad, Hubli, Kalaghatagi and Kundagol, while farmers in Navalgund taluk have devoted maximum area under this sugarcane crop during the decade from 2005-06 to 2014-15. The advantage of irrigation and the soil and topography seem to have influenced high priority for growing sugarcane crop in Navalgund taluk. There is need for a proper crop planning for sugarcane by farmers in the other four taluks as sugarcane has gained more importance by the domestic users in recent years. Scientific planning of farming and provision of needed farm inputs by the concerned agencies would be helpful in expansion of cropped area in the taluk areas in Dharwad district.

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## A Geographical Study of Landuse Efficiency in Beed District

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### Abstract:

*Land is the basic resource of human society. Its utilization shows a reciprocal relationship between the prevailing ecological condition of region and man. The term 'Landuse' is employed of varied surfacial and dynamic uses of the land and soil surveys e.g. land under cultivation, pasture, barren, orchard, fallow, waste, culturable waste, settlements, forests, water bodies, etc. On varied terrain conditions and soil types.*

*The study of landuse is of prime importance for the economic development of people. The potentiality of region depends upon the intensive and extensive use of the land. The intensive use of land bears population concentration, economic prosperity through better agricultural production, human establishments, industrial location, communication and transportation lines, while extensive use of the land bears sparse population, dispersed settlements solitary transport network. However, it is only through the systematic use of the land that economic and cultural development can be made possible. Thus one cannot think of progress without a proper utilization of land. Hence, the study of landuse is of immense in and scheme of regional development and planning.*

**Key Words:** Landuse Efficiency, Agricultural land.

### Introduction:

Landuse is the surface utilization of all developed and vacant land on a specific point at a given time and space. This "leads on back to the village farm and the farmer, to the fields, gardens, pastures, fallow land, forest and to the isolated farmstead" as geography deals with the spatial relationship between these aspects and planning.

According to J.L. Buck, "land utilization is the satisfaction, which the farm population derives from the type of agriculture developed, the provision for future production and contribution to a national needs." (Quoted 1951)<sup>1</sup> while the definition given by Setter is as follows. "Land Utilization research can be described as dealing with problem situations in which people in a given locality are in the process of transformation from activities with certain land requirement to activities with different land requirements." (Kelso 1962)<sup>2</sup>. In this sense land utilization involves an examination of the natural factor affecting both the harnessed and the potential productivity of the land in changed situation of the locality and its requirements. These factors are the land temperature, rainfall, and soil, which in configuration together constitute the physical background of agriculture and determine the limits of both the cultivability and productivity of the land.

### Choice of the Topic:

The Maharashtra state is one the progressive state of India and is divided in six administrative divisions and one of them Aurangabad division. Aurangabad Administrative division includes 08 districts i.e. Aurangabad, Jalna, Parbhani, Hingoli, Osmanabad, Latur, Nanded, and Beed. The present research problem is concerned with Beed district.

Beed district is situated in the South Central part of Maharashtra and lies between 18°27' and 19°27' north latitudes and 74°49' and 76°44' east longitudes. It is surrounded by Aurangabad and Jalna district. To the north, Parbhani district to the north east, Latur district to south east and Osmanabad district to the West. Eleven tahsil i.e. Asti, Patoda, Shirur (k), Gevorai, Majalgaon, Beed, Kaij, Dharur, Wadwari, Parali (V) and Ambajogai are considered for the study. Beed district has significant location on Maharashtra plateau. Physiographically the district broadly divided in three divisions. The northern part of the district include Balaghat plateau or Balaghat range and the western part of the district especially Asti tahsil includes Seena River Basin. Hence it is support to high concentration of agriculture.

**Objectives:** The prime objectives of the present study are as follows.

1. To assess and uncover the profile of physical background of the study region in order to understand the influence on agriculture of these factors namely relief, climate, drainage, soil, natural vegetation etc.
2. To study land use efficiency in the study region.

**Database and Methodology:**

The data collected and used for the period 1990-91, 1999-2000 to 2000-01, 2009-10, comes both from primary and secondary sources. The primary data is the raw data collected through different sources particularly questionnaires and personal inter views. Secondary data obtained from Socio-Economic Review, District census, Handbooks, Gazetteers, Agricultural, Epitomes, Periodicals, Season and Crop Report published by the different Agricultural Department. The data thus collected through primary and secondary sources were processed by statistical and cartographic techniques. On the basis of primary and secondary data with the help of various statistical and cartographical methods and techniques, researcher studied spatial as well as temporal changes in food grain cultivation in Beed district from 1990-91, 1999-2000 To 2000-01, 2009-10.

Landuse efficiency may be defined as the extent to which the net sown area is cropped. The gross cropped area as percentage of the net sown area gives measure of land use efficiency, which means the intensity of cropping. The index of land use efficiency is obtained by using the following formula.

$$\text{Index of Land efficiency} = \frac{\text{Grosscroppedarea}}{\text{NetSownarea}} \times 100$$

**Landuse Efficiency in Beed District:**

The proportion of potential agricultural land (uncultivated land) increased from 6.35% to 7.44% it means area under this category was increased by 1.09% in during 1990-91 to 2009-10 in the Beed district. There is scope for extension of cultivated land by bringing fallow and potential land under cultivation. Therefore, immediate need is to give more emphasis on intensity of cropping and increasing yield from existing calculated area. Problem of under use of net sown area, low productivity and risk of crop failure are talking the rural population. Therefore, it is a faithful to investigate the degree of intensity with which the net sown area is utilized.

**Table No 1.1: Statement showing Landuse efficiency in Beed District  
 (Area in hectors)**

Sr. No	Name of the tahsil	(1990-91 to 1999-2000)			(2000-2001 to 2009-2010)			Volume of change in Landuse efficiency
		Gross cropped Area	Net sown Area	Index of Landuse Efficiency	Gross cropped Area	Net sown Area	Index of Landuse Efficiency	
01	Asti	1,20,100.91	1,18,908.40	101.00	1,40,499.98	1,30,386.00	107.76	+6.76
02	Patoda	68,871.01	45222.10	152.30	61507.80	48273.00	127.42	-24.88
03	Shirur(k)	59,594.00	48294.00	123.40	57357.74	51787	110.76	-12.64
04	Gevorai	1,54,311.50	137882.90	111.97	139908.78	134862	103.74	-08.23
05	Majalgaon	1,02,066.63	78036.00	130.79	104981.66	82562	127.15	-03.64
06	Wadwani	26,170.00	19261.00	135.87	25865.00	19576	132.13	-03.74
07	Beed	1,50,078.13	121237.00	123.79	135391.00	124985	108.33	-15.44
08	Kaij	1,20,940.91	93635.40	129.16	95821.84	89129	107.51	-21.65
09	Dharur	37,266.00	24003.10	155.25	36652.00	21876	167.54	+12.29
10	Parli	68,433.72	54277.60	126.08	70485.00	57681	122.20	-03.88
11	Ambajoga	92,128.48	56904.20	161.90	95241.90	74116	128.50	-33.04

	i							
12	Total District	10,00031.29	7,97661.70	125.37	963630.26	835233	115.37	-10.00

Source: Socio-Economic Abstract of Beed District for 1990 to 2010.

Table no. 1.1 reveals that, in during 1990-91 to 1999-2000 region gross cropped area, and net sown area was 10 lakh. 31.29 hectares and 7 lakh 97 thousand, 6 hundred 61.70 hectares respectively in the study region. Whereas, in during 2000-01 to 2009-10 gross cropped area and net sown area was experienced 9 lakh, 63 thousand 6 hundred 30.26 hectares. and 8 lakh, 35 thousand two hundred 33 hectares respectively in the study region. The index of land use efficiency was found in 125.37 in during 1990-91 to 1999-2000, where as in during 2000-01 to 2009-10 land use efficiency index was observed 115.37. It means that index of land use efficiency was distressed by 10% in the study region in during the period of investigation.

In during 2000-01 to 2009-10 below 125 land use efficiency index was found in Asti, Shirur(k), Gevora, Beed, Kaij and Patodatahsils while 125 to 150 land use efficiency index was observed in Patoda, Wadwani, Majalgaon and Ambajogaitahsil where as above 150 land use efficiency index was noticed in Dharurtahsils in the study region.

**Conclusions:**

Index of land use efficiency was distressed in every tahsil, in exception of Asti, and Dharurtahsils in during the period of investigation in the study region. It means that positive and negative changes were occurred of land use efficiency index in the study region. Below -13 negative changes was found in Shirur(k), Georai, Majalgaon, Wadwani and Patodatahsils while -13 to -23 negative changes was observed in Beed and Kaijtahsils, where as above -23 negative change land use efficiency index was noticed in Patoda and Ambajogaitahsil. Below +10 positive changes was registered in Asti tahsil and above +10 positive changes in land use efficiency index was experienced in Dharurtahsil in the study region in during the period of investigation.

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## Role of Small Scale Industries in Rural Development of Ratnagiri District of Maharashtra

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### Introduction

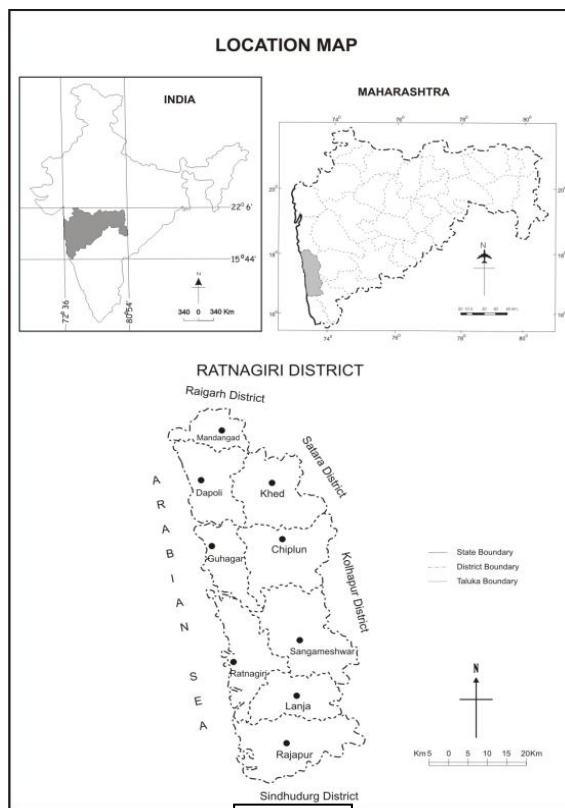
The Indian economy during the current fiscal years has shown considerable growth performance by contributing to create livelihood opportunities to millions of people in magnifying the export potential and in increasing the overall economic growth of the country.

Ever since the announcement of the industrial policy resolution of 1948, small-scale industries have occupied a prominent place in the overall strategy of industrial development in India. Successive five-year plans have allocated increasing resources for the development of small industries. In view of the abundance of labour, scarcity of capital, and rural nature of the economy, the preference for small industries is natural. High employment potential widely dispersed entrepreneurial base, relatively low capital investment, regional balanced development and export potential these are main arguments in favour of small industries.

Small-scale industries are defined to include those units, which have investment in plant and machinery up to Rs. 3 crore, and for tiny units the investment limit is Rs. 25 lakh. The development commissioner has clearly stated that the small-scale units have "Inherent advantage of diversification of industrial base, dispersal of industries in rural and semi urban areas and equitable distribution of national income."

In India Small Scale Industries occupy 36 million units, contribute to 45% of industrial production, 40% to the export sector through more than 6000 products ranging from traditional to high tech and provides employment to about 80 million persons. Therefore the small scale industries (SSI) in a developing country like India occupy a special place in the industrial structure.

### Study Region



Map 1.1

The district lies on the western coast of India. Geographically Ratnagiri district extends between 16o30' to 18o04' north latitude and 73o02' to 73o52' east longitude. The total geographical area of the district is 8249 sq.km. The district stands twenty-second (2.7%) in terms of area in the Maharashtra State. The district has a north south length of about 180 km and east-west extension of 64 km. It has a coast line of 167 km. The total population of the district was 1696777 with 8 towns and 1519 villages as per 2011 Census. There are nine tahsils in Ratnagiri District. The study region is western part of Maharashtra bounded by Raigad district in the north, Arabian sea in the west, Sindhudurg district in the south and Sahyadri hills in the east. Beyond the Sahyadri hills Satara, Sangli and Kolhapur districts are located (Map. 1.1).

### Objective

The present paper has attempted

1. To study the growth of Micro, Small and Medium Enterprises in Maharashtra and Ratnagiri District.
2. To study performance of Small Scale Industry in Ratnagiri District.
3. To study the effects of Small Scale industry on Rural Development.

### Data base and Methodology

The Secondary data is used for the purpose of analysis and interpretation. The secondary data are referred from District census Handbook, Socio-economic Abstract of Ratnagiri district, District Industrial



Centre Report, Report of DIPS Ratnagiri, Report of MSME Development Institute, Mumbai, Maharashtra Industrial State profile, Economic Survey of Maharashtra and Journals, books, articles, government published annual reports, websites etc. The collected data have been computed by recent research techniques and the results were brought through maps and diagrams.

Maharashtra is one of the leading states in adopting policies for promoting industrialization and encouraging development of industrially backward areas. The economic policies of the 1970's steered the State to gain a prime position in industrialization. Since then, several changes in terms of policies have come into effect and structure of industries has changed substantially. The growth momentum was further pushed ahead by the liberalization policy adopted in August, 1991. Major industries in the State include chemical & allied products, electrical & non-electrical machinery, textiles, petroleum & allied products and information technology. Other important industries include metal products, wine, jewellery, pharmaceutical, engineering goods, machine tools, steel & iron castings and plastic wares.

The objective of Maharashtra Industrial Policy 2001 is to further accelerate the flow of investment to industry and infrastructure by promoting information technology, high-tech knowledge based and Bio-tech industries, augmenting exports from the industrial units in the state and creating large scale employment opportunities duly ensuring environmental planning. The state has entered into the phase of second-generation economic reforms with the emphasis on structural changes in addition to fiscal incentives for the promotion of industry and balanced industrial growth.

Development of industries results in enhanced productivity accelerated economic growth and creates more and varied employment opportunities. It also facilitates development of other sector. Maharashtra is the most industrialized state. There is very high concentration of Small Scale Industrial units in seven states, viz. Maharashtra, Uttar Pradesh, Punjab, Haryana, Tamilnadu, Andhra Pradesh and West Bengal. These states accounted for 53% of the total units in small sector 55 % of the total employment, 68% of total fixed investment and 60% of the total production.

Any programme of development of a region has to be based, among other things on the availability of required resources in that region. If the region possesses a good number of resources industrialization is accelerated. But it is also true that development, if it has to be sustained over a long period, should primarily depend on the availability of a number of resources such as agricultural, horticultural, forest, mineral, marine, water, animal husbandry, power, mineral and human resources. The Manufacturing and services categories have been classified into micro, small and medium enterprises in plant and machinery for manufacturing enterprises providing services. As per fourth census of MSMEs 2006-07 as on 31<sup>st</sup> March 2007, in all 86635 MSMEs were working in the state with an investment of 14859 crore and employment by 10.95 lakh. Upto September 2015, in all 2,43721 MSMEs with an investment of 56552 crore generating employment of 29.19 lakh were functioning. Yearwise investment and employment in MSMEs and regionwise information of MSMEs is given in the Table 1.1 & Table 1.2 respectively.

**Table 1.1 Maharashtra – Investment and Employment in MSMEs 2015-16**

Year	MSMEs	Investment in crore	Employment in Lakhs
2006-07	86635	14859	10.95
2007-08	96879	17140	12.35
2008-09	108561	20435	14.06
2009-10	120457	23463	15.56
2010-11	134953	29026	17.43
2011-12	150559	33469	19.5
2012-13	166695	38924	21.56
2013-14	186509	45282	24.04
2014-15	223501	52462	27.54
2015-16	243721	56552	29.19

Source :- Directorate of Industries, GOM, Economic Survey of Maharashtra.

**Table 1.2 Regionwise Micro, Small and Medium Enterprises in Maharashtra 2015-16**

Region	No. of Small Scale Industries	in %	Employment in Lakhs	in %
Mumbai	24786	10.2	4.05	13.9
Konkan(Ex. Mumbai)	39269	16.1	6.32	21.7
Nashik	27458	11.3	3.15	10.8



Pune	92233	37.8	10.05	34.4
Aurangabad	18751	7.7	1.93	6.6
Amravati	14510	5.9	1.14	3.9
Nagpur	26714	11	2.55	8.7
Maharashtra	243721	100.00	29.19	100.00

Source :- Directorate of Industries, GOM, Economic Survey of Maharashtra.

Ratnagiri is located in western coast of Maharashtra called the Konkan region. There are five maritime districts in Maharashtra viz. Thane, Greater Mumbai, Raigad, Ratnagiri and Sindhudurg from where the fishing vessels operate. As the region is having laterite soil, salty soil and coastal alluviums and suitable climate are wide scope for small-scale agro based industries. The most small scale industries in the districts are cashewnut processing, fruit preservation, silica processing, other registered units are oil mills, saw mills, cement product, sodium silicate, laundry, soap, printing, book binding etc.

Industrially, Maharashtra is one of the advanced states of the country but Ratnagiri district is one of the most industrially under developed district in the State. There are very few industries in the district. They are located in Ratnagiri, Chiplun and Khed tahsils. The industrial policy of the state is based on the basic decision to encourage industries in the developing and under developed areas in the district and to disperse industries from the heavily congested areas of Mumbai, Thane and Pune. In the district, there are six industrial areas developed by Maharashtra Industrial Development Cooperation. Viz. Ratnagiri-Mirjole/Zadgaon, Khed-Lote Parshuram, Chiplun-Kherdi, Ganekhadpoli, Sangamshwar-Devrukh-Sadavali. Also the work of five star MIDC at Nivali Phata, Ratnagiri is under progress. Co-Operative sector plays important role in the development of industries in the Ratnagiri district. There are two co-operative industrial Audyogik Sahakari Vasahat situated in Ratnagiri district. They are located in Ratnagiri and Chiplun.

The industrial growth has not been uniform all over the region. There are difficulties in analyzing regional variations in industrial growth of the region. The changes have been measured in absolute as well as relative terms. It is thus clear that small-scale sector is intended to improve the economic and occupational profile of rural, semi-urban and weaker sectors of our society. This type of the study is essential to get idea about the rural industrial development of the study region. The economy of the Ratnagiri district is agro based and agricultural resources are in abundance in this district. There is scope for agro and forest based SSI units.

#### **Growth of Small Scale Industries in Ratnagiri District**

Small Scale industries contribute to rural development in various ways by creating employment for rural growing labour force providing desirable sustainability an innovation in the economy as a whole.

In 1991-92 there were 496 permanently registered small-scale industrial units in Ratnagiri district. The number of units increased from 496 in 1991-92 to 2366 in 2015-16 (Table no 1.3). It means that small-scale industrial units are increased by 4.77 times during the period of investigation. During the first five years 214 units were added in the total figure whereas 725 units were added in the last five-year. In 1991-92 about Rs. 195.89 lakh amount was invested in 496 units. Every year investment amount was increased in the Ratnagiri district. It was tremendously increased by 152.11 times. It was increased by Rs. 29797.31 lakhs during 1991-92 and 2015-16. It indicates that entrepreneurs have invested lot of amount in their units. In Ratnagiri district production capacity of SSI units is increased by 86.31 times during the period of investigation. During the last five years production capacity was increased by 35784.43 lakhs. It means considerable change in production capacity.

**Table 1.3**  
**Small Scale Industries in Ratnagiri District**

Year	No. of Units	Investment in Rs. Lakhs	Production Capacity in Rs. Lakhs	Labour Force
1991	496	195.89	1049.82	1224
1995	651	1208.41	2061.65	2274
2000	909	3582.73	4493.36	4386
2005	1142	5784.44	27186.18	5811
2010	1641	15905.5	54834.22	10393
2015-16	2366	29797.31	90618.65	16836

Source : Report of District Industrial Centre, Ratnagiri.(1991 to 2016)

During the period of investigation labour force was increased by 13.75 times. It means that industrial development has changed the standard of living of the employed persons. Particularly this change was occurred in Ratnagiri, Khed and Chiplun tahsils.

### Conclusion

Generally Small Scale Industries plays an important role in achieving rural development inspite the positive effects of the SSI in the Ratnagiri district. There is a significant effect of location of SSI and the nature of the activity for SSI on rural development of Ratnagiri district.

Small scale units increased from 496 in 1991-92 to 2366 in 2015-16. It means that small scale units increased by 4.77 times. Investment amount was increased by 152.11 times. It indicates that entrepreneurs have invested lot of amount in their units. In Ratnagiri district production capacity of SSI units was increased by 86.31 times during the period of investigation. Labour force was also increased by 13.75 times.

There is tahsils to tahsils variation in small-scale industries due to physical factor, raw material, skilled labour, capital investment, marketing facilities etc. It is essential to mention that regional balance in this region by providing various facilities to the entrepreneurs.

For instance, promoting agricultural growth does not only increase farmers income, but it also creates new employment opportunities in the farm and off-farm sectors and can contribute positively to increased food security on the national level. In addition, globalization opens up new opportunities in the sense of providing new markets and inflows of foreign direct investments, but, at the same time, it also poses important challenges and dangers.

Small Scale Industries also occupies an important role in industrial sector at rural area. It is seedbed of innovations, inventions and employment. They contribute in increasing the volume of production and value added attract labour reducing poverty and unemployment as well as achievin equitable distribution of income among individuals.

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## Agricultural In India: A Geographical Approach

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### Abstract

*Indian agriculture is labor intensive, mostly subsistence farming, nearly 60% of its population is dependent on farming and most farms are rainfall. On the other hand, American farming is capital intensive, mostly commercial farming less than 3% of its population is dependent on farming and most farms are irrigated. Although, in both countries the major emphasis is on rapid industrialization because of the predominantly agrarian nature of the economies, the agricultural sector provides the basic foundation for industrial expansion with supplies of food, raw materials, and labor, with markets for industrial goods and with foreign exchange earned through exports of primary products. However, while India agricultural sector is growing by about 2.5 per cent. The samples of paddy were analysed for their quality parameters in respect of content of various refractions such as, foreign matter, damaged grains, discoloured, shrunken, shrivelled, weevilled, immature grains and moisture. The agricultural research system in India includes some 27,500 scientists and more than one lakh supporting staff actively engaged in agricultural research, which makes it probably the largest research system in the world. Historically, the Indian agricultural research system is the zenith of a process which started in the 19<sup>th</sup> century and which resulted in the establishment of the Imperial (now Indian) Council of Agricultural Research (ICAR) on the recommendation of a Royal Commission on Agriculture in 1929. In the present research system, the Indian Council of Agricultural Research (ICAR) at the National level mainly aids, promotes and coordinates research and education activities in the country. The development of agricultural research system in India, ever since the colonial era till today, is being tried to trace in the paper.*

### 1. Introduction

Agriculture is the backbone of the Indian economy which plays the most decisive role in the socioeconomic development of the country. Indian agriculture is a miscellaneous and extensive sector involving a large number of actors. India has one of the largest and institutionally most complex agricultural research systems in the world. It is always interesting to measure and compare the progress of these two great neighbors, comprising a large fraction of the world's poorest people, both having recently launched massive programmes of expansion and development after centuries of foreign domination, chaos and stagnation. Over and above that, the significant differences in the institutions and policies, the two countries have chosen to adopt for attaining broadly similar economic goals. This is particularly true with respect to agriculture.

Countries the pace of industrial advance is severely constrained by the vagaries of agricultural production and dependence on agriculture as a direct source of income is also very substantial, even after all these years of industrialization. One should note here that the prices at which output is valued being more favorable to industry in India. Traditionally have been agrarian economies and well over half of their billion-plus people continue to depend on land for their livelihood. Given their large populations and histories of famine, India also share similar concerns on issues such as food security. World has been steadily growing at between 4 and 5 per cent over the last 15 years. By 2005, China had in fact emerged as the world's third largest food donor. China with lesser cultivable land produces double the food grains, at 415 million tons per year compared with India's 208 million tons per year.

To conclude, in agriculture our yields per acre are well below the international norms. India could be a giant exporter of food, only if we could put our 'house in order' to near world class standards. Developed countries lesser cultivable land produces double the food grains. God has been very kind to India with a lot of sunshine, rain, rivers, lakes, coastline and good hard working citizens. The Governance in India have not done enough to show the results that it is capable of achieving rate

as the No.1 country in the world for potential vs performance. Indians score high marks on performance outside India. This is because the Governance is better outside. In countries where the Governance&Administration is poor, the performance of its citizens is also low.

India has one of the largest and institutionally most complex agricultural research systems in the world. Historically, the Indian agricultural research system is the zenith of a process which started in the 19<sup>th</sup> century and which resulted in the establishment of the Imperial (now Indian) Council of Agricultural Research (ICAR) on the recommendation of a Royal Commission on Agriculture in 1929. Since then there was a stupendous evolution of agricultural research in India.

The main events in the history of agricultural research in India can be grouped into the following seven categories (Singh, 2001):

1. Establishment of agriculture departments and agriculture colleges.
2. Establishment of the imperial council of agricultural research.
3. Initiation of commodity committees.
4. Project for intensification of regional research on cotton, oilseeds and millets.
5. Initiation of all India coordinated crop improvement projects.
6. Reorganization of ICAR.
7. The development of agricultural universities.

The early development of agricultural research in India was associated with the reappearance of famines. This acted as a nasty reminder of the little precedence accorded to agricultural research and development in colonial India.

## 2 Study Area

India comprises the lying atop the Indian tectonic plate, and part of the Plate. India defining geological processes began 75 million years ago when the Indian plate, then part of the southern supercontinent Gondwana, began a north-eastward drift caused by seafloor spreading to its south-west and later south and south-east. The vast Tethyocenic crust to its northeast began to sub-duct under the Eurasian plate. These dual processes, driven by convection in the Earth mantle, both created the Indian Ocean and caused the Indian continental crust eventually to under-thrust Eurasia and to uplift the Himalayas. Immediately south of the emerging Himalayas, plate movement created a vast trough that rapidly filled with river-borne sediment and now constitutes the Indo-Gangetic Plain. The plateau contains the country's oldest rock formations, some over one billion years old. Constituted in such fashion, India lies to the north of the equator between 6° 44' and 35° 30' north latitude and 68° 7' and 97° 25' east longitude.

## 3 Selection And Justification Of The Topic And Study Area

The Royal Commission on Agriculture, which was appointed in the year 1926, proposed that an Imperial Council of Agricultural Research should be set up to endorse, direct and organize agricultural research all over India. The council was supposed to guide the research activities of central and provincial departments of agriculture. As per the proposal of the Royal commission on Agriculture the Government of India Department of Education, Health and Lands set up Imperial Council of Agricultural Research on 16th July, 1929.

Based on numerical procedures allied to computational resources the solution of typical engineering problems can be obtained except when the model is very large, since the computer capability in these cases may be limited. Numerical methods involving geometric domain discretization is being proposed to solve problems that not show exact analytical solution from mathematical methods. The finite element method (FEM) is a numerical procedure for solving physical problems governed by differential equations. The origin of FEM cannot be accurately predicted since its basic principles date back more than 150 years.

#### 4 Objectives

The main objective of the present study is to propose sustainable comprehensive plan for the agriculture management. GIS, Remote Sensing for displaying, documenting, and analysing of agriculture information for the efficient action management. Following are specific objectives.

- To obtain precise and trustworthy details as to the cost of cultivation and produce per acre of fibre-bearing plants of promising character.
- The agriculture department may be able to form a decisive conclusion as to the prospects of a profitable exploitation of the plants in question.
- To secure a competitive trial of machines and processes for the extraction of the fibers.
- Major focus of agricultural research in colonial India was on cotton, silk, tea, indigo etc.
- Indian agricultural research in post-colonial India.

#### 5 Processing And Developing Unit

#### 6 Agricultural Research In Post-Colonial India

Since independence, there has been a substantial growth in the Indian NARS. ICAR is the chief public body at the national level for synchronizing, directing, and endorsing agricultural research and education in the country. Likewise, State Agricultural Universities are responsible for doing the same at the state level. After independence, agricultural research was given much emphasis which in turn led to increased agricultural production and near self-sufficiency in food grains in the country.

The greater emphasis given to the agricultural research could be established by the fact that the system guided by the ICAR now has 49 ICAR institutes,

- 17 national research centers.
- 25 project directorates.
- 79 All India Coordinated Research Projects (AICRPs) and AINPs.
- 607 Krishi Vigyan Kendras (KVK).
- 52 State Agricultural Universities (SAUs).
- 1 Central Agricultural University.
- 4 Central Universities having faculty of Agriculture.

The National Academy of Agricultural Research Management is yet another exclusive institution under ICAR to conduct research and training in agricultural research management.

#### 6.1 Other Organizations Research

1. Scientific organizations such as the Council of Scientific and Industrial Research, the Bhabha Atomic Research Centre.
2. Government departments such as the Department of Science and Technology and also the Department of Biotechnology.
3. Private and voluntary organizations.
4. Scientific Societies with agro familiars.

The research programme for each region was prepared by a regional coordination committee headed by the Agriculture Commissioner of India and approved by the respective commodity committees. A regional research station composed of full-fledged sections of plant breeding and genetics, agronomy, agricultural chemistry and soil science, plant pathology and entomology.

#### 6.2 Indian Research Projects

The conception of coordinated projects was first instigated in relation to hybrid maize improvement as ICAR was fascinated in maize improvement following the successful approach by the USA and several other countries. Rockefeller Foundation was the organization who was actively involved in crop improvement programmes in Mexico, Central America and the Caribbean. This organization was invited to assist the maize improvement programme in India. The postgraduate school of Indian Agricultural Research Institute (IARI), New Delhi and Research programmes on the improvement of some crops (maize, jowar and bajra, initially etc.).



Two leading scientists who were associated with Rockefeller Foundation's Maize Improvement Programmes in Mexico and Columbia visited India to study the position of maize crop and prepared a report based on their findings. This report was scrutinized by the Botany Committee of ICAR and by the Advisory Board of the Council. This provided the basis for the coordinated maize project.

The ICAR may be briefly summarized as follows:

- a. To promote, guide and coordinated agricultural and veterinary research and education throughout India.
- b. To train research workers by offering scholarships.
- c. To serve as a clearing house of information in regard to research and to advise on agricultural and veterinary matters generally.
- d. To undertake the publication of scientific papers and geo-graphs etc.

### **6.3 Development Of Agricultural Universities**

In 1948 there were only seventeen agricultural colleges in the country shows that before independence higher education in agriculture was almost ignored. These agricultural colleges were under the control of Director, Department of Agriculture of the respective states. However, colleges for animal husbandry, governed by the director, Animal Husbandry of the concerned states were separate from those for agriculture. Research and extension were the responsibility of the agriculture and the animal husbandry departments of the states.

During the years 1948-49, the University Education Commission headed by Dr. S. Radhakrishnan suggested that the country should focus on the establishment of rural universities. Major H.S. Singh and Mr. A.N.Jha (Chief Secretary and Development Commissioner, U.P.) visited Land-Grant Universities of United States in 1950 and after Pandit Govind Ballabh Pant, to set up such a university in U.P. The chief minister accepted their recommendation. In 1955 the first Joint Indo-American Team was set up. The team suggested the founding of rural universities in each of the states in India. Accordingly, the team identified U.P. (Tarai), West Bengal (Haringhatta), Bihar (Patna), Orissa (Bhubaneshwar), Travancore-Cochin and Bombay (Anand) states to be apposite for starting such universities.

In the year 1956, a blue-print for agricultural universities were prepared and this provided the root for the proposal by Government of U.P. to the Central Government (in September, 1956) for starting an agricultural university near Rudrapur in the tarai region of U.P. The Central Government also agreed to the proposal on an experimental basis. In the year 1959 the second Joint Indo-American Team was set up. The team submitted its report in 1960. The team suggested that the Agricultural Universities should be autonomous; should consist of colleges of agriculture like veterinary, animal husbandry, home science, technology and basic sciences under them.

ICAR was to undertake aid promote and coordinate agricultural education in the country. But this was not put into effective practice until the reorganization of ICAR in 1966. A full-fledged Division of Agricultural Education was set up within the ICAR to fulfill this objective. The ICAR has been crucial in the reorganization of agricultural education in the country by providing the necessary supervision, schemes for improving the quality of teaching and research. Indian Council of Agricultural Research (ICAR) is identical to agricultural research and education in the country. The role played by the council in the development of agricultural research and education has been quite extraordinary.

## **7. Indian Agriculture Under The Five-Year Plans**

### **7.1 First Five-Year Plan (1951-56)**

Indian agriculture was given the highest precedence in the First Five-Year Plan during the years from 1951 to 1956. The Plan was largely concentrating on the increasing agricultural production and strengthening of economic infrastructures like irrigation, power and transport as after independence, there was an acute food shortage faced by the country. The production of food grains increased from 54 million tons in 1950-51 to 65.8 million tons at the end of the Plan.



### **7.2 Second Five-Year Plan (1956-61)**

Agriculture to industry and only about 21 per cent of the actual plan expenditure was spent for agricultural development. There was a shortfall in the production of all crops. Sugarcane was an exception as its production had increased during the period of Second Five Year Plan. As a result of the disappointing agricultural production, the country had to import food grains from overseas to prevail over the food scarcity. During this Plan, an inflationary situation started emerging in the economy of India.

### **7.3 Third Five-Year Plan (1961-66)**

After Second Five Year Plan regarding the agricultural production objective of the Third Five-Year Plan was to achieve self-sufficiency in food grains and to increase the agricultural production to meet the needs of industry and export. As a result, the plan accorded higher priority to agriculture and irrigation than to industrial development. Consequently the country has to import Rs. 1,100 crores worth of food grains to meet the domestic demand.

### **7.4 Three Annual Plans (1966-69)**

During periods of three Annual Plans, a high precedence was given to minor irrigation. This was followed by adoption of a high yielding variety programme to increase agricultural production and productivity.

### **7.5 Fourth Five-Year Plan (1969-74)**

The Fourth Plan had two major objectives in the agricultural sector.

- To provide the conditions necessary for a sustained increase of food production by about 5 per cent per annum over the decade 1969-78.
- To enable a large section of the rural population including small farmers, farmers in the dry areas and agricultural laborers to participate in the process of agricultural development and share its benefit.

### **7.6 Fifth Five-Year Plan (1974-79)**

During the Fifth Plan, Rs. 8080 crores (nearly 21 per cent of the plan outlay) was made for agricultural development and irrigation. The Fifth Plan accorded priority for the spread of High Yielding Variety (H.Y.V) cultivation, greater use of fertilizers, pesticides and insecticides to increase agricultural production.

- Small and marginal farmers.
- Dry farming technique.
- Evolving H.Y.V. seeds for other crops like paddy.

### **7.7 Sixth Five-Year Plan (1980-85)**

The Sixth Five-Year Plan recognised that the growth of the Indian economy depends significantly on a rapid growth in agriculture and rural development. The main objective of the Plan.

- Increase agricultural production,
- Generate employment and income opportunities in rural areas and
- Strengthen the forces of modernization for achieving self-reliance.

### **7.8 Seventh Five-Year Plan (1985-90)**

The Plan allocated Rs. 39,770 crores for agricultural sector which is 22 per cent of the total plan outlay. The major programmes adopted during the plan were, a special rice production programme in the eastern region, national water-shed programme for rain-fed agriculture, national oil-seed development project and social forestry.

### **7.9 Eighth Five-Year Plan (1992-97)**

The basic objectives of the Eighth Five-Year Plan were -

- Last 40 years.
- To protract agricultural productivity and production in order to meet the increased demands of the growing population.
- To enlarge the income of the farmers.

- To create more-employment opportunities in the agricultural sector.
- To step up agricultural exports.

#### **7.10 Ninth Five Year Plan (1997-2002)**

As noted in the ninth plan, the future economic and social development of the country was in substantial measure reliant upon the technological improvements in agriculture. A massive application of science and technology would enable Indian agriculture to face the serious challenges of food security and ensure a place for value added Indian agricultural products in the global markets. The plan recognized the immense opportunities offered by technological revolutions in the field of molecular biology, biochemistry, physiology, Geographical Information System, systems analysis, revolution in informatics, remote sensing etc. The objective of the plan was tapping the potential of science and technology to improve the living conditions of the poor.

#### **7.11 Tenth Five Year Plan (2002-2007)**

India has developed an extensive system of agricultural research centers and extension services. There was reason to believe, however, that the quality of the agricultural research efforts has weakened while the extension system has virtually collapsed. Strengthening of the agricultural research and development system, with special emphasis on bio-technology, and a significant improvement in the degree of sophistication in the technology dissemination methods were found to be essential to achieve rapid and sustained growth in agricultural productivity during the Tenth Five Year Plan.

#### **7.12 Eleventh Five Year Plan (2007-2012)**

The following critical research gaps were identified in the Eleventh Plan-

- An orientation of public sector research in „hybrid development with commercial viability.
- Indigenous plant types that inherently possess genes responsible for higher nutritive value need to be identified and used for enriching nutrients incrops.
- A major research thrust is warranted in areas of balanced and site-specific nutrient supply and efficient water management strategies.
- Integrated Pest Management (IPM) needs greater emphasis.
- With endemic shortage of animal feeds, research should explore technologies to augment feed resources, including genetic modification of microorganism to utilize high lignin forage grasses.
- With large quantities of animal products now being produced, research on process technologies, value addition, packaging, storage, transportation, and marketing should receive high priority.

#### **7.13 Twelfth Five Year Plan (2012-2017)**

The objectives of the Twelfth Five-Year Plan were.

- To create 50 million new work opportunities in the non farm sector.
- To remove gender and social gap in school enrolment.
- To enhance access to higher education.
- To reduce malnutrition among children aged 0-3 years.
- To provide electricity to all villages.
- To ensure that 50% of the rural population have accesses to proper drinking water.
- To increase green cover by 1 million hectare every year.
- To provide access to banking services to 90% of households.

## **8. Conclusions**

India includes some 30,000 scientists and more than 120000 supporting staff actively engaged in agricultural research, which makes it probably the largest research system in the world. They are distributed in the ICAR system, Agricultural Universities, General Universities and other organizations. In the present research system, the Indian Council of Agricultural Research (ICAR) at

the National level mainly aids, promotes and coordinates research and education activities throughout the country.

The research and education responsibilities at the state level rest with the State Agricultural Universities. In addition to these main streams of research, some general universities and other agencies like scientific organizations related to agriculture, Government Departments, voluntary organizations, private institutions etc. National Agricultural Research System in the development of agricultural research is of great importance within which all these organizations come. Five year plans play a major role regarding investment, technology transfer and other aspects related to agricultural development in India. Although agriculture has been playing the most vital role in Indian economy, during the course of the study, it has been found that not much emphasis has been given to the history of evolution of agricultural research in India.

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## Trends And Challenges In Human Resource Management A Case Study Of Agritourism In Malaysia

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### Abstract

*Tourism is one of the most important economic activities in the world today because it directly generates services, products, foreign currency, employment and investment. Tourism provides employment to individuals of all ages and skill levels. Although tourism is a major economic sector in Malaysia, employment in this area tends to be seasonal, lacks job security and is often seen as a stepping stone to another job. However, given the highly seasonal nature of tourism, its reliance on students workers and irregular working hours, attracting and retaining employees in tourism sector is a major challenge for tourism business. Strategies focusing on different aspect of tourism employment must be put in place to make tourism a more attractive job choice.*

*This research paper aims to provide an overview of Agritourism recruitment challenges and more reliable strategies to attract and retain efficient workforce in the Agritourism industry for its development.*

**Key words:** Tourism, Agritourism, Human Resource Management

### 1.0 Introduction-

Agritourism contributes lots in improving the economy of the local communities. The agritourism, promotes both agriculture and tourism. The tourists will buy the agricultural products and spending for the tour cost such as accommodation as well. For instance, the residents can provide home stay themed accommodation for the tourist. Homestay is a form of programme that allows the tourist to live with a local family to experience their lifestyle. Thus, poverty rate in rural areas can be decreased.

One of the most important impacts of Agritourism is providing employment to local youths. The residents of rural areas especially the youths can work on accommodation service, tour guide service, restaurants or handicraft industry. This will decrease the migration of youths to cities. Besides, the abandoned land can be developed in the practice of agritourism. They can be used as aquaculture rearing, orchard farm or recreational park.

Thus agro tourism helps in improving social situations particularly poverty alleviation, decreasing unemployment and controlling urbanisation.

In this way Agritourism contributes in GDP and prosperity of the country.

### 1.1 Role of Tourism Industry in Malaysia -

Tourism is one of the most vibrant sources of economic development in the world. In Malaysia over the past decades tourism has become one of the largest and fastest growing economic sectors and is the second largest contributor after manufacturing. Revenue from tourism industry in Malaysia in last decade is represented by following table.

**Table No. 01 Revenue from tourism industry in Malaysia**

Year	Total Revenue (Million MYR)
2008	49561.2
2009	53367.7
2010	56492.5
2011	58300
2012	60600
2013	65440
2014	71998.8
2015	69119.6
2016	82098.2
2017	82200
<b>CGR</b>	<b>5.79</b>

Source: trading economic.com/ tourism Malaysia



Revenue from tourism industry in Malaysia in year 2008 is MYR 49561.2 million and in year 2015 it is increased to MYR 82200 million . The compound growth rate of revenue from 2008 to 2015 is 5.79% .

The total contribution of travel and tourism to Malaysia's GDP was 4.8% of total GDP in 2017 and is forecast to rise by 3.9% in 2018. Tourism industry also has greater capacity to generate large scale employment and additional income to skilled and unskilled workforce in the country. In 2017 travel and tourism directly supported 4.6 % of total employment . This is expected to rise by 1.1 % in 2018. The government has acknowledged the economic growth potential of tourism industry and it was identified as one of the priority areas under 10 th Malaysiaplan .

## 2.0 Agro Tourism in Malaysia

Previously tourism was mainly made up of travel , tours, fun and exploring beauty of nature . But now a days tourism industry has diversified into new areas such as ecotourism, medical tourism , geotourism , culinary tourism and agritourism.

Agritourism was started in the United States in the early 1800s. A number of countries of the world have transformed their economies through agritourism activities .The agricultural activities are important for countries including Malaysia in addressing food security, sustainability and safety to ensure availability, affordability and accessibility of food. Agritourism is an additional activity which can increase the economic return of farmland and agricultural industry.

According to World Tourism Organisation, agritourism is part of rural tourism and relates to tourism on farms . Agrotourism is actually the collaboration between tourism and agriculture. In agrotourism tourist enjoy by doing agricultural activities like harvesting , planting, fishing etc. Agritourist are exposed to agriculture practices in amore leisure fashion such as by joining picturesque canal tours, or strolling through shady fruit orchards and working in rice farms . Agritourism is when native persons or locals of the area offers the tours to their agricultural farms to allow a person to view them growing , harvesting and processing locally grown foods which the person would not encounter in their home country. The farmers would also offer a homestay programme for the visitors.

The agritourism concept was first introduced in Malaysia in 1991. It was then followed by international conference on agritourism industry held in kuala Lumpur in 1992 with the objective to clarify the concept of agritourism and to chart development strategy of agritourism in Malaysia. The number of tourists visited Agritourists centres in Malaysia is shown in following table.

**Table no. 2**

### Number of tourists visited Malaysia

Year	No of visitors ( in 000)
2007	500
2008	1000
2009	1500
2010	3000
2015	6000

source: Report of ministry of Agriculture and Agribased industry

As shown in table no. 2 number of tourists increases consistently. The tourist arrival to agritourism attraction areas in the country has increased from 0.5 million in 2007 to 1.5 mil in 2009 which shows an increase of 1 million within three years. Agritourism industry targets arrival of 12 million tourists in 2018.

## 2.1 Malaysia Government Policy Regarding Agritourism

The Malaysia GOVT. planning policies covering tourism developments are contained in the fourth five year plan (1986-90). And fifth five year plan (1990-95) by allocating more funds for



infrastructure, product development, marketing and promotional activities. In seventh Malaysia plan (1996-2000) new tourism products such as Eco and Agritourism are recommended.

The National Rural Tourism Master Plan completed in 2001 stressed on agritourism and homestay programme to provide more opportunities for local community involvement to generate new possible source of income. In ninth Malaysia plan (2006-2010) the GOVT. allocation for tourism industry has doubled from MYR 783.6 million to MYR1847.9 million . As a result in 2006 the number of homestay operators amounts to 1089 in 79 villages . More tourism products such as farmstays, visits to agricultural parks , and research stations have been introduced under homestay and agritourism programmes.

Tenth five year plan (2010-2015) put emphasis on quality of training and human resource development in order to deliver quality services by introducing different courses for Malaysian citizens.

### **1.0. Positive impact of Agritourism**

The Agritourism industry in Malaysia has plenty to offer for tourists , society and country. Because of abundant natural resources, variety of agritourism packages are available for tourist. Direct involvement of rural people in Agritourism provides employment to rural youths and help in poverty alleviation .It earns foreign currency for the country.

Thus agrotourism helps in improving social situations particularly poverty alleviation, decreasing unemployment , declining urbanisation and contributes in GDP of country.

### **4.0 Constraints in Growth of Agritourism**

Although the agrotourism has shown a good records in its developments since it is started, still improvement could be made to increase revenue from this industry. Thus there is need to go through obstacles to ensure the better route for this industry to develop further in the future .

One of the most important constraints is lack of skilled workforce or personnel in Agritourism industry. Mastering the internationally accepted language especially English to communicate with foreign tourist is most demanded skill in today's scenario. Service providers in agritourism industry are basically local rural peoples . They cannot communicate with tourist because of language problem. So workforce in agritourism industry need proper training.

Lacking of maintenance and basic infrastructure is another problem faced by agritourism industry. Visitors will only visit and revisit areas which are easily accessible with proper basic utilities and well maintained farms. Basic tourism amenities such as local transportation , comfortable accommodation and basic food service should be available for tourist .

### **5.0 Theoretical Review:**

Human resources are one of the most vital assets of an organisation .The significance of human resources in a modern organisation can be seen in the context of activation of non human resources, means for developing competitive advantages, and source of creative energy. (L.M.Prasad , 2005). Human resource management practices are set of planned strategies and policies implemented to organisation's human capital which effectively and efficiently contribute to the achievement of organisational objectives. (Mondy and Noe 2005) Basically , HRM practices involve recruitment , selection , training and development, compensation , performance appraisal and welfare of employees. All of these are considered as foundation strategies to ensure that organisation have talented human resource that enhance organisation's productivity and innovativeness. Besides these basic HRM strategies, extensive research has been conducted on various dimensions such as job security, information sharing, work life balance etc.

Human resource management practices play a vital role in attracting, motivating, rewarding and retaining employees (Noe 2008). Because of industrialisation and globalisation , the need for trained and skilled manpower becomes imperative . Companies have started recognizing the importance of HR department and are aligning HR function to the strategic business goals (Srinannarayana 2010).

The existing workforce in Malaysia has undergone a major shift in values, expectations, career path and opportunities due to changes in the social and economic environment in Malaysia. Thus, this influences the human resource management practices in the tourism industry. The industry has been struggling with recruitment issues and challenges of attracting and retaining multiskilled talented employees in the industry.

**6.0 Objectives of the Study:** Present study is based on following major objectives:

1. To study development of Agritourism in Malaysia.
2. To study Human Resource Practices in agritourism in Malaysia
3. To study Malaysia Government policy for development of Agri-tourism.
4. To study problems and prospects in agritourism in Malaysia.
5. To identify challenges in the development of agritourism industry influencing human resource practices.
6. To propose relevant transformative approaches in human resource management practices from the empirical data.

### 7.0 Methodology

Selection of sample Agritourist centres:

There are 52 Government Supported agritourist centres in different states of Malaysia, of which 13 centres (which 25 % of total sample size) is selected for present study.

Collection of Data:

The present study is based on primary and secondary data. The secondary data related to Agritourism Malaysia is collected from various books, research articles, magazines and report of ministry of agriculture and agribased industry.govt.websites.

A sample of around 13 agro tourist centers is selected randomly for establishment of objectives of the study.

Primary data is collected through Likert five point scale questionnaire mailed to incharge of agritourist centers in 13 states of Malaysia.

### 8.0 Data Analysis and Interpretation

**Table No. 03 Data Analysis**

Questions About Agro-Tourism in Malaysia	Agree	Strongly Agree	Disagree	Strongly disagree	Neutral	Total Respondent Centers
Multilingual employees	46	39	15	-	-	13
Dependence on foreign employees	23	8	38	8	23	13
shortages of employees	54	15	23	8		13
Need to create awareness in youths	38	54	-	-	8	13
Seasonal business	31	8	46	8	8	13
Fixed working HOURS	31	-	54	-	15	13
Training according to Govt courses	46	8	31	-	15	13
contract basis employment	38	8	31	-	23	13
High labour turnover	15	15	46	-	23	13
Low salary package	15	-	46	-	38	13

Source: Based on Primary data collected by Author

From the above table no 02 following inferences are presented in detail:

## 8.1. Recruiting talent- Trends and challenges

### 8.1.1 Being multilingual-

Agritourism industry is people oriented industry. Agritourism business is mainly based on effective communication skill of employees. Multilingualism is one of the most important skill expected from candidates to be recruited in agritourism industry. Candidates speaking English in addition to Malay which is mother tongue of Malaysia is clearly a competitive advantage for the agritourism industry.

As indicated in above table no. 3 about 85% of respondents are agree with this . Employees with multilingual skill can communicate with the local as well as foreign tourist effectively visiting Malaysia especially Arabs, Indians and Europeans . Thus recruiting multilingual candidates speaking more than one language is a challenge for HR in agritourism industry.

### 8.1.2 Multiskilling and multitasking employees

As agritourism industry requires people with specific skills like multilingualism ,ready to work in agriculture and for more than normal hours. So sometimes they face problem of shortage of employees with required skills. In above table no 3 ,about 69 % of respondents are agree with the problem of shortage of employees. Also in off season ,it become need to give employees some different work to engage them.

Recruiting or developing existing employees with multiple skills sets , also known as multiskilling, can help solve problems arising from labour shortage , seasonality issues and employee retention.

Multiskilling enables companies

1. Cut back on number of employees.
2. Make the best use of human resources.
3. Increase employee retention.
4. Reduce human resource cost.
5. Ensure greater productivity.

So recruiting employees with multiple skill set or developing existing workforce to acquire multiple skills by proper training programme is a challenge for current HR department.

### 8.1.3 Dependence on foreign employees

As local people are not keen to work in agriculture and sometimes they are choosy of work also. So some agritourism centres are dependent on foreign employees like Bangladeshi , Nepalians , Indonesians and Philippines. As indicated in table No. 3, about 31 % respondents are agree with this trend. So this dependence on foreign workers is also one issue which can increase labour cost to industry and also time consuming for their work visa .

So, by offering better package to local people can avoid this dependence on foreign employees..

### 8.1.4 Job fair and marketing campaigns

Now a days there is shortage of employees with required skills applying for jobs in agritourism centres. Awareness about job opportunities and prospects in agritourism sector should be made by organising job fair and marketing campaigns. According to table no. 3, about 92 % respondents are agree with the need to create awareness in today's youths regarding job opportunities in agritourism .So creating this awareness regarding available vacancies in tourism is one more challenge to HRM department .

## 8.2 Retention – Trends and challenges

### 8.2.1 Stabilizing seasonal employment

In general tourism is a seasonal industry. In table no. 3, about 39% respondents are agree with this . Seasonality of this industry makes jobs in tourism a less attractive option for potential applicants. The employment in this sector can be stabilized by helping employees to find work in another business. Potential employees are offered a year round work with two different seasonal

employment whose busy periods are complementary rather than mutually exclusive. Thus stabilizing seasonal employment in agritourism is one of the critical challenges faced by industry. In some fruit farms, in off season they start some other activities like rafting, canyoning, flying fox and many other shifting their workforce in these activities. But in some centres, they need to be updated with such other income generating activities to engage workforce and utilize them effectively and efficiently in off season.

#### 8.2.2 Job Security

As most of the employees recruited in agritourism are on contract basis, mostly contract of one year. As indicated in table no. 3, about 46% of respondents agree with this. Because of job insecurity in contract basis recruitment, employees treat this job as stepping stone to another permanent jobs and switch to more secured permanent jobs in another field. So instead of contract base, industry should recruit permanent local employees. This will reduce labour recruitment cost and labour turnover also.

#### 8.2.3 Work life balance

In agritourism industry working hours are more and generally not fixed. As indicated in table no. 3, about 54% of respondents agree with this. So it becomes less attractive option for perspective candidates like mothers and students. So this can be solved either providing job in shifts or giving flexibility in working hours.

Work life balance has become priority among employees especially working mothers. Flexi timing is really a good strategy to retain employees like working mothers who want to maintain work life balance.

#### 8.2.4 Stagnant wages and remuneration packages

In agritourism labour turnover is more and one of the reasons behind labour turnover is salary received by employees working in agritourism field. They receive very less salary as compared to their working hours.

In the process of attracting and retaining talents, companies need to review their compensation, rewards and benefits structure to attract new talent as well as retain existing talent. With the rising cost of living, employees are expecting companies to review their compensation and benefits structure to enable them to manage their cost of living. Here, the true challenge will be with review of the compensation, benefits and reward structure, find ways to manage cost of employment. You can't over inflate your cost simply to attract and retain talents. Design and develop other performance based rewards schemes that are highly attractive to them and also cost effective.

#### 8.2.5 Training programme to match industry requirement

Malaysia government started different training programmes to match tourism industry requirement such as homestay operator training, tourist guide course, spa therapist course and we are the host and Malaysia welcomes the world (MWW) course. So candidates selected to work in agritourism should be trained as per their jobs. In most of the GOVT supported centres training is given according to government courses. In above table no. 3, 54% respondents agree to this hypothesis. But in private centres training is given internally which is not up to the mark. Proper training of candidates increase their morale and their performance and simultaneously reducing turnover of employees. Thus training programme to match industry requirement is one more necessity to retain employees in agritourism.

#### **Conclusion:**

Agritourism industry contributes in economic growth of country and it has growth potential. Growth of Agritourism industry largely depends on its employees performance because it is people oriented industry. Now a days this industry faces some challenges in attracting and retaining employees. Human resource departments should formulate new policies or should amend existing policies to overcome these challenges. Challenges such as multilingualism and multiskilling can be conquered by giving proper training to existing employees in government training centres or

recruiting employees from institutions providing courses in agritourism. Challenges such as shortage of employees can be overcome by creating awareness in youths regarding job opportunities and prospects in jobs of agritourism. This awareness can be generated by organising job fair and marketing campaigns by centres and Govt. Problem of working hours and work life balance can be solved by providing flexible working hours or working in shifts. Challenges of labour turnover and dependence on foreign employees can be conquered by providing fair remuneration packages to local employees. Similarly, seasonality can be beat by starting other activities to engage employees throughout year.

Thus overcoming obstacles in recruitment and retention of workforce, agritourism industry can ensure consistent growth in its contribution to GDP of country.

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**Agriculture Production In Karnataka Performance, Problems And Prospects****Nizamuddin**

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**Abstract**

*Karnataka occupies eighth place in terms of geographical area of the nation having 1,91,791 Sq.k.m area. This constitutes 6.31 percent of the land area of the nation. According to census 2011, the population of the state is 6, 11, 30,704 ( Source : Census of India 2011 ) which constitute 5.05 percent of total population of the nation. Around 66 percent of the population lives in rural area (Source census of India 2001). It is playing significant role in the state economy which not only offers direct and indirect employment opportunities to the people even it is supplying primary food ingredients to the mankind and fodder to the animals. The very existence of agro based industries in the state dependence on agriculture sector. . In this working paper "Agriculture production in Karnataka: Performance Problems and Prospects" an attempt is made to study the major aspects like budget allocation for agriculture development, area and production of principal crops, the main problems of agriculture sector in Karnataka with agriculture prospects if it is developed further. The study found that Government of Karnataka has shown its keen interest in the development of agriculture sector by earmarking huge amount of capital allocation in its successive budgets. The revised advance estimates of agriculture department indicates the production of 97.50 lakh tones cereals and 12.50 lakh tones of pulses which accounted to 110 tonnes of total food grains in the year 2015-16. And the oil seeds production 9.60 tones, cotton 14.04 bales, sugarcane 405 tones and tobacco 0.82 tones which accounted to 429.46 tonnes of total cash crops. With reference to the area under production of principal crops, revised advance estimates of agriculture department revealed the fact that 75.50 lakh hectares of land was under the production of total food grains and 27 lakh hectares of the area was under the production of cash crops for the year 2015-16. Report of the official group of Government of Karnataka in its report entitled "Improving the economic condition of farmers" (2007) has highlighted the some of the major reasons for distress of farming community which is leading to farmers suicides based on dialogue with farmers representatives. . If the recommendations of the official group are implemented in a effective manner the Karnataka's agriculture can become future model for the whole country.*

**Key words:** Agricultural production, Agricultural productivity, Area under production, problems of farmers.

**Introduction:**

Karnataka occupies eighth place in terms of geographical area of the nation having 1,91,791 Sq.k.m area. This constitutes 6.31 percent of the land area of the nation. According to census 2011, the population of the state is 6, 11, 30,704 ( Source : Census of India 2011 ) which constitute 5.05 percent of total population of the nation. Around 66 percent of the population lives in rural area (Source census of India 2001). One of the major features of Karnataka economy is heavy dependence on agriculture sector. About 56 percent of the population depends on agriculture for their lively hood. It is playing significant role in the state economy which not only offers direct and indirect employment opportunities to the people even it is supplying primary food ingredients to the mankind and fodder to the animals. The very existence of agro based industries in the state dependence on agriculture sector. In addition to this agriculture sector opens the wide market for industrial products like for machineries, chemical fertilisers, pesticides, insecticides etc as a input. It contributes 35 per cent to the gross state domestic products (Source: Agricultural estimates 2010-11). Its role in foreign trade also well appreciating one. Tea, Coffee, Sugar, Tobacco, Silk, Cashew are some of major agricultural exports. In this working paper "Agriculture production in Karnataka: Performance Problems and Prospects" an attempt is made to study the major aspects like budget allocation for agriculture development, area and production of principal crops, the main problems of agriculture sector in Karnataka with agriculture prospects if it is developed further.

**Rationale of the study:** Firstly this study attempts to high light the major achievements of agriculture sector in Karnataka in terms of budget allocation, area and production under major crops. Secondly this paper discusses some of the major problems encountered by the farming community in agriculture sector in Karnataka and also the paper briefly highlights the prospects of agriculture sector in Karnataka, if it is developed further.



### Objectives of the study

- To know the budget allocation for agriculture, area under major crops and production of major crops in Karnataka
- To study the major problems encountered by farming community in agriculture sector of Karnataka.
- To understand the main prospects of agriculture sector in Karnataka.

**Methodology:** This paper to proceed to highlight the performance problems and prospects of agricultural sector in Karnataka state secondary data has collected from Agricultural department, Directorate of economics and statistics Bangalore. It has also collected the secondary data from economic survey of Karnataka 2015-16 Department of planning programme monitoring and statistics Government of Karnataka.

### Distribution of Karnataka's total geographical area 2013-14

**Table 1**  
**Financial allocation for agriculture department (Rs in lakhs)**

Sl. No.	Classification	Area (laksh ha.)
	Total Geographical Area	190.50
1	Forest	30.73
	Not available for cultivation	
2	a) Land put to non-agri uses	14.44
3	b) Barren & uncultivable land	7.87
4	Cultivable waste	4.11
	Uncultivated land excluding fallow land:	
5	a) Permanent pastures & other grazing land	9.06
6	b) Misc. Tree crops, Groves	2.81
	Fallow land	
7	a) Current fallow	17.00
8	b) Other fallow land	5.25
9	Net Area Sown	99.23
	<b>Total (Gross) Cropped Area</b>	<b>122.67</b>
	Area sown more than once	23.44
	<b>Cropping Intensity - %</b>	<b>124</b>

Source: Economic Survey of Karnataka 2015-16, Table 7.4, Page: 199

The above table 1 reveals the fact that out of total geographical area 190.50 lakh hectares the net area sown constitute 99.23 lakh hectares accounting 52 percent of total geographical area. The land area sown more than once constitute 23.44 lakh hectares and gross cropped area including area sown more than once is 122.67 lakh hectare. According to agriculture census 2010-11 about 76.44 percent of total land holdings are held by small and marginal farmers which accounts 40.05 percent of the total operated area.

### The financial allocation for agriculture in Karnataka.

In order to develop the agriculture sector in a comprehensive way the government of Karnataka has been introducing various schemes and flagship programmes like "Krishi Bhagya", "Bhoochetana", "organic farming" farm mechanisation and "Ganga kalyana yojane" etc. The agriculture department was allocated Rs. 2881.41 crore for the year 2015-16. The below table 2 gives the details of budget allocation for the agriculture department from 2013-14 to 2015-16

**Table 2**  
**The budget allocation for Agricultural department Form 2013-14 to 2015-16, (Rs in lakh)**

Year	2013-14	2014-15	2015-16
Allocation	169255.73	214425.05	288141.11

Source: Economic Survey of Karnataka - 2015-16, Table 7.1, Page: 195

It is clear from the above table 2 that the Government of Karnataka has shown its keen interest in the development of agriculture sector by earmarking huge amount of capital allocation in its successive budgets. For the purpose of overall development of agricultural sector thrust has been given to minor irrigation, Soil health management etc.

**Area under principal crops and production of principal crops.** According to the economic survey of Karnataka 2015-16 and as per the advanced estimates of agricultural production the area under principal crops and production of principal crops in Karnataka are given below in table3.

**Table 3**

**Area and Production of Major Crops in the State, (Area in lakh hectares, Production in lakh tonnes)**

Crop / Group	2015-16*		2014-15**		Average growth over previous year (%)	
	Area	Prod.	Area	Prod.	Area	Prod.
Cereals	45.58	97.50	48.73	112.32	-0.06	-0.13
Pulses	29.92	12.50	23.16	13.90	0.29	-0.10
Total food grains	75.50	110.00	71.89	126.22	0.05	-0.13
Oilseeds	13.54	9.60	13.73	9.59	-0.01	0.00
Cotton #	6.13	14.04	8.75	23.11	-0.30	-0.39
Sugarcane>	6.34	405.00	6.91	437.76	-0.08	-0.07
Tobacco	0.99	0.82	0.94	0.67	0.05	0.22

Source: Economic Survey of Karnataka - 2015-16, Table 7.2, Page: 197

Lakh bales of 170 Kg. lint, \*\* Final Estimates of DE&S, \* Revised Advance Estimates of Agriculture Dept.>

The revised advance estimates of agriculture department indicates the production of 97.50 lakh tones cereals and 12.50 lakh tones of pulses which accounted to 110 tonnes of total food grains in the year 2015-16. And the oil seeds production 9.60 tones, cotton 14.04 bales, sugarcane 405 tones and tobacco 0.82 tones which accounted to 429.46 tonnes of total cash crops. whereas final estimates of Directorate of economics and statistics revealed that for the year 2014-15 total food grain production was 126.22 tonnes which includes 112.32 tonnes and 13.90 tonnes of cereals and pulses respectively and 471.13 tonnes of cash crops which includes 9.59 tones, 23.11 tones, 437.76 tonnes and 0.67 tonnes of oilseeds, cotton sugarcane and tobacco respectively.

With reference to the area under production of principal crops, revised advance estimates of agriculture department revealed the fact that 75.50 lakh hectares of land was under the production of total food grains and 27 lakh hectares of the area was under the production of cash crops for the year 2015-16. As per the final estimates of Directorate of Economics and Statistics the area under total food grains production was 71.89 lakh hectares and 30.33 lakh hectares under the production of cash for the year 2014-15.

### Major problems of farming community

Report of the official group of Government of Karnataka in its report entitled "Improving the economic condition of farmers" (2007) has highlighted the some of the major reasons for distress of farming community which is leading to farmers suicides based on dialogue with farmers representatives, some of the major problems of farming community are as fallows.

- **High cost of cultivating the crops :** It was observed that the farmers who were cultivating the crops like onion, potato, Tur dal with high cost of production were in high tendency in suicides.
- **Low productivity:** The productivity in agriculture in Karnataka in comparison with other green belt states like Punjab, Haryana is also low.
- **Instability in agricultural production:** Lack of irrigation caused for instability in agricultural production. More than 70 percent of cultivable land is unirrigated in the State.
- **High rate of interest by Non-institutional finance sector:** Farmers in the state heavily depends on informal non institutional money lenders who charge high rate of interest. Since there is instability in production and low productivity in agriculture farmers are failed to settle the loans obtained by these sector
- **Presence of high size of small and marginal farmers:** The survey reveals that more than 73 percent of the farmers are small and marginal with an average land holding of below one hectare land.
- **Dominance of Cereals in total food grain production:** Though the monsoon is favourable to grow cash crops the farmers in the state struck in growing cereals. Horticulture crops are grown only in 12 per cent of net crop area and 54 per cent of area is in the production of cereals.
- **Regional Imbalance in agricultural production productivity:** There is a problem of Regional Imbalance in agricultural production and productivity and area under principal crops across state.
- **Shortage of storage and cold storage facilities:** There is a Shortage of storage and cold storage facilities to stock agricultural produce in times of surplus.
- **Defective marketing system:** Farmers in the state are unable to get remunerative prices for their produce due to defective marketing system in the state.

### Prospects for the agriculture sector in Karnataka

It is true that agriculture development in Karnataka is not up to the mark. Farmers suicides have been increasing day by day. As per the report of the agriculture department 1605 farmer's suicides were reported between 2004 to 2007. Subsequently the present coalition governments and previous governments announced a major policy of waiver of agricultural loans of small and marginal farmers. The department of agriculture on 14th June 2007 organised a convention of farmer's leaders of the state for a direct dialogue with the chief minister. After this convention the government of Karnataka has constituted a 13 members official group under the chairmanship of the then principal secretary of finance department Sri M.R. Srinivasa Murthy to recommend measures to eliminate the problems of farmers in agriculture in the state. If the recommendations of the official group are implemented in an effective manner the Karnataka's agriculture can become a future model for the whole country. Some of the prospects to the agriculture sector in the state are as follows.

- **Agriculture sector can create multiple sources of farm income** If agriculture sectors are developed in a comprehensive way through promotion of horticulture crops, encouraging dairy poultry, sheep rearing and promotion of sericulture and apiculture etc in the state can create multiple sources of income to the farmers.
- **Group farming can be strengthened:** The burning issue in Karnataka's agriculture is small and fragmented holdings in rural areas. Wherever the small and marginal farmers are more in numbers a Co-operative farming can be developed which solves the problem of small and fragmented holdings.
- **Optimisation of advantages of irrigation** The gains of the irrigation projects are confined only to few districts in the state. By encouraging and developing minor irrigation projects which yield results in a quick time, we can extend the benefits of irrigation to the whole farming community in the state.
- **Horticulture Revolution:** Karnataka's climatic and monsoon conditions are suitable to grow horticulture crops. If coconut, mango, Sapota, Guava, amla with regular field crops like millets, cereals, pulses and oilseeds would be grown it will generate high income to the farmers. Therefore more cultivable area should be brought under horticulture cultivation.
- **More stress on dairy farming** The recent years experience in the state has proved that dairy can be the most fruitful to the farmers. There is an urgent need to encourage more and more dairy farming in the state.
- **Development of poultry** There is a high demand for poultry products across the nation. The government must encourage modern poultry farming among the farmers which can generate guaranteed income.
- **Encouragement to live stock farming** With changing consumption habits of people in and around the country there is a continuous increase in the demand for sheep and goat meat. Normally rearing of these animals for meat is taken care of by small and marginal farmers which is a completely unorganised activity. If the government provides proper support for this activity farmers in the agriculture sector would benefit immensely.
- **Sericulture is also a remedy** Sericulture is a traditional source of income to the farmers in the state. But it is facing stiff competition from the Chinese silk industry. There is an urgent need to provide institutional support to Karnataka's Sericulture industry.
- **Bright future in the field of exports** The fruits, vegetables, flowers and other cash crops are in high demand in neighbouring countries. Karnataka's plantation crops have made a good name to the state. The government must encourage the farmers to grow more and more these crops through proper incentives and motivation.
- **Application of information technology** Application of information technology in the field of agriculture like the present "Bhoomi" Scheme which maintains agriculture land records would definitely promote the development of agriculture by reducing the cost of production and eliminating corruption to some extent.

Thus the agriculture sector can play a pivotal role in the development of the state as well as in the country. To strengthen the agriculture sector priority should be given to increase irrigation facilities, increase in farm productivity and provision of storage and cold storage facilities and other important infrastructure in the field of agriculture, more stress should be provided for diversification of the cropping pattern as well.

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## Institutional Credit and Capital Formation in Indian Agriculture

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### Abstract

*Agriculture, with its allied sectors, is unquestionably the largest livelihood provider in India. Most of the industries also depend upon the sector for their raw materials. Steady investments in technology development, irrigation infrastructure, emphasis on modern agricultural practices and provision of agricultural credit and subsidies are the major factors contributed to agriculture growth. Access to credit facilities is one of the key determinants of private capital formation in agriculture. Farmers' credit needs are met by institutional and non-institutional sources. Capital formation is vital for inclusive and sustainable growth of the agriculture and allied sector. The rate of growth of gross capital formation (GCF) in agriculture has shown a positive relation with the agricultural output. Public sector investment has been an important source of GCF in agriculture and an enabling factor in maintaining agricultural growth. The present paper is an attempt to evaluate the extent of institutional credit contributed in formational capital in Indian agriculture thereby its contribution to nations GDP.*

*Keywords: Agriculture, Institutional Credit, Gross capital formation, Import, Export,GDP*

### Introduction:

Agriculture is the backbone of Indian economy. The prosperity of the country depends up on the agriculture sector. It plays a strategic role in the economic life of the Indian society. India is principally an agricultural country. Agriculture, with its allied sectors, is unquestionably the largest livelihood provider in India. Most of the industries also depend upon the sector for their raw materials. Steady investments in technology development, irrigation infrastructure, emphasis on modern agricultural practices and provision of agricultural credit and subsidies are the major factors contributed to agriculture growth. As per 2011 census sixty nine percent i.e. 833 million people live in rural areas of India. In the Indian economy agriculture contributes one-third of the national income. Sixty percent of the export directly or indirectly originates from agriculture sector. It provides employment to 67 percent of the work forces. It plays a decisive role in economic development and planning and provides numerous to the industrial and service sector.

Capital and labour are the two important factors of production. To some extent, they are substitutable but to a greater extent they are complementary to each other. Both fixed capital and working capital are required for agriculture to perform its various operations in a timely and cost-effective manner. Capital in agriculture is formed by both public and private sectors. Public sector capital formation consists of investment in agricultural infrastructure such as minor and major irrigation projects, R&D and extension services, rural roads, electrification of villages, etc. Private capital formation comprise of investment made by the farmers in farm machines, tube-wells, field channels, land development and other productive assets and inputs. Both public and private capital formation is necessary for energizing the Indian agriculture.

### Review of Literature:

Relevant literature has been exhaustively surveyed and analyzed so as to identify the current state of affairs in the fields of agriculture credit. **Krishna and Raychaudhuri (1981)**, in their study on capital formation in India, made an attempt to know the trends in rural household savings and the growth of tangible net wealth in rural India from 1950-1973. The results show that there has been an accretion of savings and capital formation in recent years. **Vivekanand (1999)**, in a study in Karnataka state, observed that there was a direct relationship between size of holdings and the percentage of households availing loan facilities **Gulati and Bathla (2002)** first examined the temporal behaviour and structure of public and private gross capital formation (GCFA) in India. He then dissected different components of GCFA by digging into the concept, coverage and estimation procedures. **Karmakar (1998)**, in a study on capital formation in agriculture in both public and private sector in India, observed that the private investment in agriculture was determined by three factors, namely, i) public investment or complementarily between public and private investment ii) technology and iii) terms of trade. It was concluded that the falling role of public investment in

agriculture was due to the falling sectoral allocation in the national plans, increase in recurring expenditure and partly due to under-use of irrigation project.

### Objectives & Methodology:

The study relies on secondary data compiled from various journals, magazines working paper and news papers, Budget document and economic survey GoI etc. Data on area, production and yield were collected from the Directorate of Economics and Statistics (DES), Ministry of Agriculture. In the light of above discussion, following are the objectives of the present study:

1. To review the status of Indian agriculture
2. To analyze the institutional credit to Indian agriculture
3. To analyze the Share of Agriculture & Allied Sector in Total GVA
4. To assess the determinants of public as well as private capital formation in Indian agriculture
5. To assess the quantum of capital formation in Indian agriculture

### Analysis and Interpretation of Data:

Agriculture is the oldest industry in the World and the largest even today. Agriculture is the backbone of Indian Economy.

1. Share of Agriculture & Allied Sector in Total GVA
2. Growth in Gross Value Added
3. Production of Major Agricultural Crops
4. Plan-wise share of public sector outlays & expenditure under agriculture & Allied Activities
5. Flow of Institutional Credit to Agricultural Sector (Rs Crore)
6. Perspective Credit Plan
7. India's Top 10 Agricultural Commodities (Exports & Imports )
8. India's Imports And Exports Of Agricultural Commodities
9. Share (%) of Gross Capital Formation (GCF) TO Gross Value Added (GVA)
10. Sectoral Contribution in Indian economy

### Share of Agriculture & Allied Sector in Total GVA

Since the beginning of economic reforms in 1991, growth in agricultural GDP has shown high volatility. Gross Value Added (GVA) of Agriculture and Allied Sector and its share in total GVA of the country during the last 3 years including the current year, at 2011-12 current prices is as follows:

**Table-1**  
**Share of Agriculture & Allied Sector in Total GVA (Rs. in Crore)**

Sector	2013-14	2014-15	2015-16	2016-17
GVA of agriculture and allied sector	1926372	2068958	2175547	2372085
Percentage to total GVA	18.6	18.0	17.5	17.4

Growth in Gross Value Added (at 2011-12 basic prices)

There has been a continuous decline in the share of agriculture and allied Sectors in the GVA from 18.6 percent in 2013-14 to 17.4 percent in 2016-17. Falling share of agriculture and allied sectors in GVA is an expected outcome in a fast growing and structurally changing economy. Growth (over the previous year) in the total GVA of the economy and that in the GVA of agriculture and allied sectors at 2011-12 basic prices is given below:

**Table-2**  
**Growth in Gross Value Added (at 2011-12 basic prices) (in percent)**

Year	Total GVA	Agriculture & Allied sector GVA
2013-14	6.1	5.6
2014-15	7.2	-0.2
2015-16	7.9	0.7
2016-17	6.6	4.9

Agriculture and Allied sectors witnessed a growth of 5.6 per cent in 2013-14, (-) 0.2 per cent in 2014-15, 0.7 per cent in 2015-16 and 4.9 in 2016-17 at 2011-12 basic prices. The vicissitudes of growth in the agricultural and allied sector have implications for overall growth of GVA and in 2016-17 the percentage contribution to total GVA growth was much larger than 2015-16. Agricultural productivity depends on several factors. These include the availability and quality of agricultural inputs such as land, water, seeds and fertilizers, access to agricultural credit and crop insurance,



assurance of remunerative prices for agricultural produce, and storage and marketing infrastructure, among others.

The perusal of below Table-3 reflects that the total oilseeds production in the country in 2016-17 is estimated at 32.10 million tonnes which is higher by 6.85 million tones over the production achieved during 2015-16. Production of sugarcane is estimated at 306.72 million tonnes which is lower by 41.73 million tonnes than the production of 348.45 million tonnes during 2015-16. Despite lower area coverage during 2016-17, higher productivity of cotton has resulted in a higher production level of 33.09 million bales (of 170 kg each), i.e., an increase of 3.09 million bales, as compared to 30.01 million bales during 2015-16. Production of jute & mesta estimated at 10.60 million bales (of 180 kg each) is marginally higher than the level of production of 10.52 million bales during the 2015-16.

**Table-3**  
**Production of Major Agricultural Crops (Million Tonnes)**

Crops	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Food grains</b>	244.49	259.29	257.13	265.04	252.02	251.57	275.68
<b>Pulses</b>	18.24	17.09	18.34	19.25	17.15	16.35	22.95
<b>Oilseeds</b>	32.48	29.80	30.94	32.75	27.51	25.25	32.10
<b>Cotton</b>	33.00	35.20	34.22	35.90	34.80	30.01	33.09
<b>Jute &amp; Mesta</b>	10.62	11.40	10.93	11.68	11.13	10.52	10.60
<b>Sugarcane</b>	295.96	342.38	361.04	341.20	352.14	362.33	348.45
<b>Tobacco</b>	0.80	0.75	0.66	0.74	0.84	0.80	-

Source: Annual Report, Ministry of Agriculture cooperation GoI 2017-18

**Table-4**  
**Plan-wise share of public sector outlays & expenditure under agriculture & Allied Activities**

Five Year plan/ Annual Plan	Agricultural & Allied Activities		Total Plan Outlay		% Share of Agriculture & Allied Activities	
	Plan Outlays	Actual Expenditure	Plan Outlays	Actual Expenditure	Plan Outlays	Actual Expenditure
Ninth Plan (1997-2002)	42462	37239	859200	941041	4.9	4.0
Tenth Plan(2002-07)	58933	60702	1525639	1618460	3.9	3.8
Eleventh Plan(2007-12)	136381	163105	3644718	3676936	3.7	4.4
Twelfth Plan(2012-17)	363273	NA	7669807	NA	4.7	NA
Annual Plan(2012-13)	56669	52521	1251715	971951	4.5	5.4
Annual Plan(2013-14)	64098	61356	1370936	1281022	4.7	4.8
Annual Plan(2014-15)	11531	9795	484532	420882	2.4	2.4
Annual Plan(2015-16)	11657	10942	578382	582707	2.0	1.9
Annual Plan(2016-17)	19394	NA	706248	NA	NA	NA

Source: Annual Report , Ministry of Agricultur7 cooperation GoI 2017-18

### **Agriculture Credit:**

Institutional sources consist of commercial banks, cooperative banks, regional rural banks (RRBs) and cooperative credit societies. Government announces annual target for agriculture credit in the budget every year. Agricultural credit flow has shown consistent progress every year. The agriculture credit flow target for the year 2016-17 was fixed at Rs. 9,00,000 crore and against this target the achievement was Rs.10,65,756 crore. The agriculture credit flow target for 2017-18 has been fixed at Rs.10,00,000 crore and till October, 2017 against this target a sum of Rs.6,71,113.42 crore has been disbursed.



**Table-5**  
**Flow of Institutional Credit to Agricultural Sector (Rs Crore)**

Year	Cooperative Banks		RRBs		Commercial Banks		Total
	Amount	% Share	Amount	% Share	Amount	% Share	
2012-13	111203	18.31	63681	10.49	432491	71.20	607375
2013-14	119963	16.43	82653	11.32	527506	72.25	730122
2014-15	138469	16.38	102483	12.12	604376	71.50	845328
2015-16	153295	16.74	119260	13.03	642954	70.23	915509
2016-17	142758	13.40	123216	11.56	799781	75.04	1065755

Source: Annual Report, Ministry of Agriculture & Cooperation GoI 2017-18

The agency-wise share of credit flow to the agricultural sector during the last five years is furnished in above table.

**Table-6**  
**Perspective Credit Plan (both Investment Credit & Production Credit) for 2020 (Rs. Crore)**

Periods	GDP Agrl @ 4.1%	GCF Agrl. ICOR =4.05	Pvt. Invnt. (@ 77.8% of GCF Agrl.	Pvt. Invnt + induced Invnt.	Invnt. Credit (@ 63.33% of Pvt. invnt.	Prodn. Credit (6)*3.2	Total Credit (6)+(7)	Total Credit#
2009-10	603743	122560	98048	128579	81429	260573	342002	362522
2010-11	628496	127585	102068	132599	83975	268719	352694	375619
2011-12	654264	132816	106253	136784	86625	277200	363825	389293
2012-13	681089	138261	110609	141140	89384	286028	375412	403568
2013-14	709014	143930	115144	145675	92256	295219	387475	418473
2014-15	738083	149831	119865	150396	95246	304786	400032	434034
2015-16	76345	155974	124779	155310	98358	314745	413103	450283
2016-17	799847	162369	129895	160426	101598	325113	426711	467249
2017-18	832641	169026	135221	165752	104971	335906	440877	484964
2018-19	866779	175956	140765	171296	108482	347141	455623	503464
2019-20	902317	183170	146536	177067	112137	358837	470974	522781
Total	8184618	1661478	1329183	1665024	1054461	3374267	4428728	4812250

# Total credit calculated after adjusting for inflation @6.0 per cent on a tapering basis.

Source: Samir Samantara & K. C. Badatya\*, A Perspective on Agricultural Credit for 2020

**Agricultural Trade:**

Major commodities imported to India are pulses, edible oils, fresh fruits and cashew nuts. Major commodities exported by India are rice, spices, cotton, meat and its preparations, sugar, etc. Over the past few decades, the share of agricultural imports in total imports has increased from 2.8% in 1990-91 to 4.2% in 2014-15, whereas the share of agricultural exports has reduced from 18.5% to 12.7%. Below tables show the major agricultural exports and imports over the past three years.

**Table-7**  
**India's Top 10 Agricultural Commodities (Exports) (Rs. Crores)**

Sl. No.	Commodity	2012-13	2013-14	2014-15	2015-16	2016-17
1	Rice-basmati	19409	29292	27599	22719	21604
2	Spices	15177	15146	14842	16630	19442
3	Rice (other than basmati)	14449	17795	20336	15483	17145
4	Cotton raw	20277	22338	11643	12821	10982
5	Sugar	8576	7179	5327	9825	8678
6	Fresh vegetables	3407	5384	4612	5237	5772
7	Coffee	4711	4799	4973	5125	5668
8	Groundnut	4065	3187	4675	4075	5454
9	Oil meals	16519	17070	8128	3599	5371
10	Cashewnut	4067	5095	5566	5028	5303
	Total Agri& allied exports	227193	262779	239471	215396	227554

Source: Pocket Book of Agricultural Statistics 2017

The perusal of above table reflects export of agriculture commodities since 2012-13.

**Table-8**  
**India's Imports and Exports of Agricultural Commodities**

Year	Agricultural imports	Total imports	% share of Agricultural imports	Agricultural Exports	Total Exports	% share of Agricultural Exports
1990-91	1205.86	43170.82	2.79	6012.76	32527.28	18.49
2000-01	2086.23	228306.64	5.29	28657.37	201356.45	14.26
2010-11	51073.97	1683466.96	3.03	113046.58	1136964.22	9.94
2011-12	70164.51	2345463.24	2.99	182801.00	1465959.31	12.47
2012-13	95718.89	2669161.96	3.59	227192.61	1634318.29	13.90
2013-14	85727.30	2715433.91	3.16	262778.54	1905011.00	13.79
2014-15	121319.02	2737086.58	4.43	239681.04	1896445.47	12.64
2015-16	140289.22	2490298.08	5.63	215396.55	1716378.08	12.55
2016-17	164726.83	2577665.59	6.39	226651.94	1849428.76	12.26

Source: Pocket Book of Agricultural Statistics 2017

The perusal of above table reflects imports of agriculture commodities since 2012-13.

**Table-9**  
**India's Top 10 Agricultural Commodities (Imports) [Value In Rs crores]**

Sl. N.	Commodity	2012-13	2013-14	2014-15	2015-16	2016-17
1	Vegetable oils	53562	44038	64894	68677	73047
2	Pulses	13345	11037	17063	25619	28523
3	Fresh fruits	6180	7716	9544	11072	11241
4	Cashew nut	5434	4668	6600	8701	9027
5	Wheat	6	27	61	873	8509
6	Sugar	3094	2287	3668	4038	6868
7	Cotton raw	2467	2376	3101	2566	6337
8	Spices	2716	3452	4392	5400	5758
9	Misc processed items	1268	1474	1749	1811	2116
10	Cocoa products	1049	1072	1551	1399	1540
11	Oil Meals	210	200	273	430	975
	India's Total Agri and allied imports	<b>95719</b>	<b>85727</b>	<b>121238</b>	<b>140311</b>	<b>164680</b>

Source: Annual Report ,Ministry of Agricultur7 cooperation GoI 2017-18

The above table indicates that India since ages has been known to be an agrarian country as nearly 60% of its population is dependent on agriculture for living. During the mid-1960s, India suffered a shortage of agricultural products that later on led to the green revolution that revolutionized the agricultural sector. India not only was able to fulfill the demands of countrymen but it also exported many agricultural goods for profits to other countries. In the present time as well, India's agricultural export amounts to \$33.87 billion as of 2017. This amounts to 10.5% of total export that Indian does.

### **Gross Capital Formation (GCF) in Agriculture and Allied Sectors**

Capital formation is vital for inclusive and sustainable growth of the agriculture and allied sector. The rate of growth of gross capital formation (GCF) in agriculture has shown a positive relation with the agricultural output. Public sector investment has been an important source of GCF in agriculture and an enabling factor in maintaining agricultural growth. Increase in agricultural production and productivity leads to increase in the income of the farmers. This increased income of the rural community will lead to more savings which can be used for either further development of non-agricultural occupations, as well as industry. Gross capital formation (GCF) in agriculture and allied sectors relative to GVA in this sector has been showing a fluctuating trend from 16.5 per cent in 2012-13 to 16.4 per cent in 2015-16.

**Table-10**  
**Share (%) of Gross Capital Formation (GCF) TO Gross Value Added (GVA) ( in Percentage)**

Year	At 2011-12 Prices			At Current Prices		
	Public	Private	Total	Public	Private	Total
2011-12	2.4	15.9	18.2	2.4	15.9	18.3
2012-13	2.4	14.1	16.5	2.4	14.0	16.3
2013-14	2.1	15.6	17.7	2.1	15.1	17.2
2014-15	2.3	15.0	17.3	2.3	14.1	16.3
2015-16	2.8	13.6	16.4	2.8	12.6	15.4
2016-17	2.7	12.8	15.5	2.6	11.2	13.8

Source: Annual Report ,Ministry of Agricultur7 cooperation GoI 2017-18

Gross Capital Formation (GCF) in Agriculture and Allied Sectors is estimated separately for public, private corporate and the household sectors. Gross Capital Formation (GCF) in Agriculture and Allied Sector relative to GVA in this sector has been showing a steady decreasing trend.

**Contribution to GDP:**

According to 2011 census, the country’s rural population is almost 83.25 crore (68.8% of total population). There has been wide consensus that the rural development should be inclusive and sustainable in order to alleviate the poverty. Agriculture is an important part of India's economy and at present it is among the top two farm producers in the world. This sector provides approximately 52 percent of the total number of jobs available in India and contributes around 18.1 percent to the GDP. Below table depict the sectoral contribution in Indian economy.

**Table-11**  
**Growth Rate of GVA at basic price at Constant (2011-12) prices (in %)**

Sector	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Agriculture	1.5	5.6	-0.2	0.6	6.3	3.4
Industry	3.3	3.8	7.0	9.8	6.8	5.5
Service	8.3	7.7	9.8	9.6	7.5	7.9

Source: Central Statistics Office.

**Table-12**  
**Sectoral Share in GVA at basic price at current prices (2011-12 Series) (in %)**

Sector	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Agriculture	18.5	18.2	18.6	18.2	17.7	17.9	17.1
Industry	32.5	31.8	30.8	30.0	29.8	29.3	29.1
Service	49.0	50.0	50.0	51.8	52.5	52.8	53.9

Source: Central Statistics Office.

India is expected to achieve the ambitious goal of doubling farm income by 2022. The agriculture sector in India is expected to generate better momentum in the next few years due to increased investments in agricultural infrastructure such as irrigation facilities, warehousing and cold storage. Furthermore, the growing use of genetically modified crops will likely improve the yield for Indian farmers. India is expected to be self-sufficient in pulses in the coming few years due to concerted efforts of scientists to get early-maturing varieties of pulses and the increase in minimum support price. The government of India targets to increase the average income of a farmer household at current prices to Rs 219,724 (US\$ 3,420.21) by 2022-23 from Rs 96,703 (US\$ 1,505.27) in 2015-16.

**Conclusion:**

Agriculture plays an important and vital role in any economy. It is directly and indirectly linked with the economic activity, growth and development of other sectors in an economy and to overall welfare and development of an economy and development of the country generally and rural development particularly. As a result of credit, Indian agriculture developed over time and showed all signs of resilience to natural shocks like droughts and famines. It acted as a means to provide control over resources to enable the farmers to acquire the required capital for increasing agricultural production. India has the capacity to produce the food grains which can make vast difference in Indian Economy. To achieve targeted mark by the government it needs to provide support in case of land, bank loans and other machineries to the small farmers along with the big farmers with this we can expect some improvement in Indian economy. Change is happening in rural India but it has still a long way to go.

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## The Role of Panchayat Raj Institutions in Rural Development with special reference to Women Empowerment

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### Abstract

*Indian women have had little representation in institutional politics since independence. The empowerment of women is becoming an increasingly popular term in human rights and developmental discourses. Women play significant role in all walks of life. Empowerment of women is a necessary basic condition for socioeconomic development of any society. Leadership is necessary not just to govern but to change the nature of governance. Women have been struggling for self-respect and autonomy. Women in Panchayati Raj Institution Political system and decision making process in seen clearly in the changes incorporated in the Panchayati Raj Institution. The objective of bringing improvement in the socio-economic condition of women could be successful only by taking suitable initiatives and measures for empowering them.*

### Introduction:

Panchayati Raj is not a new phenomenon in the country. Its illustration in history goes back to more than a 1000 years. It has its roots in Ancient Indian Institutions when the villages were little republics governed by their Panchayats. During this period, it was not that women could not join politics, but the fact was that they did not take interest in it due to a patriarchal set up. The British through their ruthless method of revenue collection and the introduction of zamindari land tenure system almost destroyed these ancient republics and as well the involvement of women in politics. The British were of the view that "Vote of Women" would be premature in the Indian Society and continued to enforce purdah and prohibition against women's education. (Bhagat 2005). After Independence, despite having a constitution, which embodies lofty, ideals like equity and equality, social justice could not be achieved so far. Even when India had a woman Prime Minister for quite a number of years, the situation of women at large did not change for the better. Women's participation in politics remained quite insignificant in India even after 59 years of self-rule. (Nanda 2006)

### Review of literature:

A review of the previous studies on this topic is quite essential to understand what the other research scholars have already explored through their research studies, books and articles. Bargava and Subha (2002), define political empowerment 'as the capacity to influence decision making process, planning, implementation and evaluation by integrating them into the political system. It implies political participation which includes right to vote, contest, campaign, party membership and representation in political office at all levels and effectively influences decisions thereby leading to political empowerment'. Sangeetha Purushothaman The empowerment of women in India, Sage Publications New Delhi of women in India, Sage Publications New Delhi, 2003 p.34 – mentions that the vast literature on women and development provides the tools to analyse the social and economic status of women in Panchayats. G.S. Mehta – Participation of women in the Panchayathi Raj system Kanishka publishers, New Delhi, 2002, p.150 reveals that proportion of women members in Panchayats had visualized at least some degree of improvements in their social standings. Bidyut Mohanty, Joy Roy and Smita Gupta – Women and Political empowerment – Institute of Social Sciences, New Delhi, 1997 p.53 – narrates that in order to make our democracy legitimate, women will have to make their full contribution in the political main stream. V. Prabhavathi Perceptions, Motivations and performance of Women Representatives Classical publishing company, New Delhi, 1991, p.121 – states that lady members found immense satisfaction of their role as elected representatives in Panchayatats.

### Objectives of the study:

It is with a view to making an in-depth study of the Empowerment of Women Representatives in Panchayats, that this study was undertaken. Among other objectives, the specific objectives of the study are as under:

- ❖ To study the involvement of elected women representative in decision making.
- ❖ To study the problems faced by the elected women representatives of Panchayats.
- ❖ To suggest suitable measures for the empowerment of women in PRIs

### Provision in the Act

Women constitute about half of the world's population but they are the largest excluded class in almost all spheres of life. It is estimated that they have only 1/10\* of the global income, own 1/100 of the means of production; nearly 70 percent of the women live below the poverty line; and two



thirds of them are illiterates. They constitute almost invariably a small minority of those holding elected office. Participation of women in Panchayati Raj Institutions is considered essential for enabling them to participate effectively and independently in development and political processes and to influence the decision-making process. Prior to the 44<sup>th</sup> Constitutional Amendment, there was no significant presence of women in local government. Before 1985, only 2 women in almost all the states of India participated in PRIs and that too by co-option/nomination. The 73 Constitutional Amendment Act which came into effect on April 23, 1993 made a provision of 33 percent reservation of seats to women in Panchayati Raj Institutions. The 73 Amendment is a landmark in the history of women's development as it is a revolutionary step towards participation of women in decision-making process especially at the grass-roots level. "The Act provides for the reservation of not less one third of the total number of seats for women. Further not less one third of the total number of offices of Chairperson in the Panchayats at each level shall be reserved for women. This would be rotated among different Panchayat at each level.

### **Role of women in Panchayat**

**Participation in Election:** The act provides for the reservation of not less than one third of the total number of seats for women. It is an attempt to ensure greater participation of women in election process directly and indirectly. It would be a nursery of creating women position for national politics. Even the participation of common women citizen in various activities such as attending gram sabha voting etc. has reportedly increased (68-78 percent).

**Participation in Decision making:** The participation of women as elected as well as non elected members are rising due to reservation for women. It acts as a full factor for women to participate in meetings. They give their suggestions for various works and problems faced by them.

**Agent of social revaluation:** Women are acting as agents of change in the society and raising voice against injustice and atrocities.

**Reducing corruption and violence:** Due to women's responsibilities towards officer and male elected representative or breaking, which has a direct impact on reducing corruption. The role of local muscle power has substantially reduced due to active participation and awareness of women about their rights and power.

**Reduction in violence against women:** Domestic violence has substantially declined due to women pradhan or Sarpanch, Chairperson. These women representatives take pro-actively taken up such violence. The victims also feel free to share their grievances to women representatives.

**Reduction in violence against Dalits:** The dominance of upper cast patriarchy is substantially declining, hence the shackles of caste are subsiding.

**Practicing participatory democracy:** Growing participation of marginalized election of general and women in particular is transforming our democratic setup from representative democracy to participated democracy.

### **Problems faced by women in PRIs**

Negative and positive aspects of plan or programme are natural things. But in the sensitive issue like women empowerment it is very important to find out the problem and also find out the solutions and suggestions to overcome these problems.

There are several problems in the field of women representative in PRIs. It seems that it is injustice with the women until we are not able to solve such problems. Some of the main problems identified as:

- Political intervention in the functioning of Panchayat
- Women act as proxies for men.
- Husband's intervention of elected women in the day-to-day functioning.
- Lack of political awareness among women in rural areas.
- Negative public opinion regarding women's leadership capacity.
- Illiteracy or low standard of education among the women in rural areas.
- Lack of training for women representatives.
- Dominance of elected male members of the Panchayat.

### **Suggestion for effective participation of women in Panchayat Raj System:**

- 1) Political parties' intervention in the election and functioning of Panchayat creates a hostile environment for the women contestants and women representatives. The Government should take a strict action in such an intervention of political parties and free and fair elections should be conducted.
- 2) Most women are elected because of the status of their husband, father or sons and such women act as proxies for men's view at the councils being advised by their member relations. It shows that women representatives are unable to perform their duties. This negative mentality should be changed and Government should organize camps to restrict male members from intervening in their independent



functioning. Family members motivation in general and husbands moral support in particular is essential

- 3) It has been mostly found that the husband of an elected women representative always intervenes in her day-to-day functioning and decision making matters which is a big draw back in the women's participation.
- 4) In rural areas political awareness among the women is negligible, hence State Government and Local Administration educate the women about political issues and create awareness among them by organizing special training, refresher course and camps. It gives them confidence and create political awareness and power.
- 5) For efficient and effective work women representative should be given more power as compared to male counterparts. Government should make provisions in this regards.
- 6) There should be a provision to give honour financial reward, incentive should be given to the women member for their exemplary work.
- 7) Government, NGOs and Universities have to play a vital role in this field. Government should encourage the Universities to do research and find out the problems in the way of implementation of different women programmes.
- 8) There should be proper check on grassroots level for the success of programmes.

### Conclusion:

It has to be considered that the inclusion of well qualified women in village Panchayat at the initial state of the interlocation of Panchayati Raj Institution in rural areas would be an important instrumental measure in planning for improving social status and empowering women. This group of women, if provided representation at village Panchayat level can strongly rise in the issues related to the betterment of women, can play dominant role in decision making process and make suitable recommendation for improving the status of women in the meeting. Its creates opportunities for women to exercise more control over design and provisions of services and the management of resources it may benefit. Good number of women competing with men in local politics, forwarding gender related agendas is looked as a way towards gender equity. The Government should provide external financial, administrative or political assistance to women for success of the provision of the amendment. Women constitute half the population of our country. So it becomes necessary to encourage the women in such a largest democracy of the world.

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## A Study On The Role And Participation Of Women In Agriculture Development

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### Abstract

*The changing status and position of women and the role of women in agriculture development is an important field for intensive research in the recent period. In this paper an attempt has been made to study the several determinants which may affect participation of women in agricultural activities directly or indirectly, and come out with strategies which can be implemented to improve the participation of women in agricultural activities. Agriculture is the back of Indian economy. The economy growth of our country depends largely on the prosperity of agriculture. The source of exploitation and disabilities of women are rooted in their ignorance. Helpless, Landlessness, lack of education and inequality in such a long magnitude they have not been activity involved in the main stream of development and there is hardly any appreciation and recognition of their extensive contribution.*

### Objectives Of The Study:

1. To Understand role and Participation of Women in Agriculture Development
2. To Study determinants of Women participation in agriculture.
3. To understand strategies for better participation of women in Agriculture.

**Methodology Of The Study:** Keeping in view the specific objectives the Study analyses role and participation of Women in Agriculture Development. The study is mainly based on secondary sources of data collected from various magazines, Books, Journals, News Papers, and Articles.

### Introduction

The historians believe that it was women who first domesticated crop plants and there by initiated the art and science of farming Women have played and continue to play a key-role in the conservation of basic life support system such as land, Water, Flora, Fauna, Without the total intellectual and management to shifting cultivation, arrest gene and soil erosion and promote the care of the so Hand health of economic plants and farm animals (swaminathan,1985).

Irrespective of the different rates of women work participation in development and developing countries, there is a general agreement that they are subjected to labor market discrimination and segregated to low paying and low status -jobs, which leads to marginalizing the economic role of women in the process of development (Varghese,1993). Since 1990 women's have identified as key agents of sustainable The World Bank has suggested that empowerment of women should be a key aspect of all social development programs (World Bank, 200).

In this back drop, an attempt has been made to discuss the issues related present poison & Participation, determinants of women participation in agriculture, gender discrimination, mechanism and suggestion for better utilization of women population in agricultural activities and development.

### Participation Of Women In Agriculture

The role of women in the agricultural and economic development of country can hardly be ignored but their economic activity outside the home is contingent upon various factors like economic need, educational attainments, husband-'s status, availability of job opportunities and family obligations as well a the attitudes and the value of the community towards giant full employment of women. It is because of this reason that participation rates of women in the labor force are lower than men in most of the countries of the world (Singh, 1980).

The face of the Indian farmer is a woman's face. The women farmer is the kingpin of agriculture. Not just a secondary helper. She is the major partner, Agriculture, which is the largest sector for employment. And further has most women workers, needs to come centre stage, because on the health and prosperity of this sector lies the well being of our economy society (Krishna raj and Shah, 2004). As Men's participation in agriculture declines, the role of women agriculture production increases (Emmy Simpsons, 2002).

### Determinants Of Women Participation In Agriculture

Neoclassical economic theory suggests that female's labor supply to agriculture is not only a function of her own market wage offer (substitution effect), but also a function of her family welfare (income effect). Thus, a family is an economic agent which maximizes its welfare subject to time to

time and budget constraints. Each individual within the family must choose between work in the market, at home and leisure to maximize a utility (Groan, 1980).

### **Gender Discrimination:**

In the gender based segmentation of labor force some activities are generally restricted to men and others to women. Agricultural activities are often termed as men's job and house-work as women's job. In agricultural systems, the roles, Rights and Responsibilities of men and women who farm. Differ according to geographical and cultural contest. In male dominated society like ours men are assigned those types of work which have a direct exchange value and therefore the work of men is considered less prestigious in the social hierarchy. Thus, it may be said that culture determines gender appropriate characteristic in the allocation of work tasks (Raj Mohan Seth,1991). In the countries like India, occupationally there is no balance between male and female members.

Agricultural development programs are usually planned by men and aimed at men. Mechanization, for example alleviates the burden of tasks that are traditionally men's responsibility leaving women's burdens unrelieved and even increased, all agricultural services still have sectors biased in favor of men, for instance, group discussion meetings are usually held in villages involving mostly men, further, the venue and timing of such meetings are inconvenient to women and hence even most needy women are not able to attend, and is similar in the case of training.

**Technology transfer:** Women's participation in agriculture is adversely affected by modern methods of cultivation, which results in gradual displacement of women and shrinking of their activities. Most of the agricultural development programs are planned even today by men for men. As and when technologies developed, they were focused towards male farmers, and the development and encasement of capabilities of farm women are rarely the consideration. There is a clear bias in research on technology in favor of males. Technological change in agriculture as a result in decreasing employment opportunities and displacement of women workers from agricultural activities. Technology itself can create gender barriers. There is anecdotal evidence that pesticide packs or typically too large for women to carry. And that foot pedals in tractors are not designed for use by women. Besides some of the new technologies have displaced women from many traditional activities. Such women try to take up in a work available to them e.g. road construction forest produce collection etc. At times they are subjected to verbal or sexual abuse or physical harassment.

**Non-availability of loans:** Financial institutions are hesitant to extend credit for agricultural activities taken up by women as they lack security. At the same time women are unaware of the existing credit facilities. Physically unable to reach the banks. unfamiliar with policies and cumbersome procedures. Moreover, there is lack of women's groups or cooperatives which may help women in obtaining the required credit (Sharma, 2000).

**Off-season Problems:** During off-season the women in agriculture have to struggle hard to find alternative sources of income, the absence of alternative opportunities for employment in the rural sector is intensified by the decline of traditional handicraft.

**Other factors:** About 90% of rural women are unskilled and 80% are illiterate, which makes them vulnerable to exploitation. Low level of nutrition and frequent pregnancies make them prone to poor health and thus limiting their productivity. If the number of children is large, the female participation is likely to be low; if the family size is big, the participation by women may be more, if the age distribution is in favor of adult women or the sex ratio is favoring women, relatively more females may participate in agriculture work.

### **Impact of Technology and Mechanization:**

Technology is central to accelerating agricultural growth. Realizing the benefits of technology and innovation will require: working with poor farmers to identify and tackle their key problems, develop a range of new technologies and practices and enable farmers to hear about, choose from and obtain appropriate new and existing technologies.

The role of women in technical development in agriculture has been receiving special attention only in recent years. Agriculture, food processing, composting technology, mushroom technology, medicinal plants, sericulture, poultry, aquaculture, dairy and animal rearing are the main areas in which transfer of technology into women hands can raise the level of productivity. Though the technical development during initial stages of green revolution had resulted in a decrease in women involvement, the transfer of technology into women hands is an important approach to bring them back into the mainstream.

Making Science and Technology Work for Women Farmers: Investments in science and technology drive agricultural development. The application of modern science to the agricultural sector raises factor productivity more than similar investments in the industrial sector. Some examples of making science and technology work for rural women are; development of improved crop varieties, appropriate technology for production and processing and appropriate technology for irrigation.

The following suggestions and strategic plans may help in better participation women in agriculture.

- Women's programmers must recognize the balance, which exists in the workloads and working conditions of men and women. Many programmers designed for women neglect the already heavy burden of the work they carry.
- First of all recognize women's role as farmers and producers of crops and live stocks; as users of technology; as active agents in marketing; processing and storage of food and as agricultural laborer. Secondly, assess the needs of women farmers and provide agricultural support services such as input support, technological support and extension support.
- Provide adequate organizational and financial support to the women groups to make them "**Self-help-Viable-Units**".
- The important requirement for effective integration of rural farm women into the stream of development is to build their access to resource base, such as land and other movable properties.
- Support women-managed rural production and marketing ventures in horticulture, floriculture and post-harvest processing in commodities. Provide training and input support to take advantage of emerging high-value agribusiness sector including biotechnology and forest products.
- Agricultural education institutions and training centers should develop regular curricula and provide technical training in agriculture and allied sectors to help women farmer take up a vocation in agriculture and allied sector. Also training in increased managerial organization entrepreneurial and decision-making skills.

### Conclusions

Women in agriculture have vast potential. intelligence and ability, which if trapped properly, may enable them to join the mainstream of agriculture development. The source of exploitation and disabilities of these women are rooted in their ignorance, helplessness, landlessness, lack of education and inequality of status. It is, therefore, necessary to equip women with required information, knowledge and skills to enable them to do their work efficiently and become equal partners in agricultural production.

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## Impact of Green Revolution For Sangli District (Mh): A Geographical Study

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### 1. Introduction

Our planet is mainly dependant on the history. History is evidence for major changes and its impacts on earth system that are large and complex. They already put the pressure on the environment since ancient period. Wide range change and that affects human and wild life due to Geography change. History proves there is serious impact across the globe in forest, food security, agriculture, water, and our economic system. Scientists studied the latest models and projections show global Geography changes. The attention of particular Geography location across the globe, help to know various Geography zones as you travel around the globe.

Among the different agriculture changes and social impact are food related natural system which affects inclusive of Geography factors. As compared to other Geography changes as like war, earthquake, landform, and impact due to agriculture and are more difficult to measure. The changes in land use affect the response of particular area to rainfall. It has wide spatial dimension.

The most happenings connected to agriculture, forest, vegetation, human culture, wild life and local as well as national economies. Agriculture is highly dangerous and serious disasters considering all other natural calamities its show to Geography periods. Agriculture is the most important disasters which are mostly occurred by natural as well as human actions. There have been effects on the large region and have an impact on regional food production, food security, life expectancy for populations and economic performance of large regions. Also affects parallel disciplines like technology, seed, production quality, marketing, transportation, international arguments etc.

*“After the Second World War, a “Green Revolution” began to transform agriculture around the globe, allowing food production to keep pace with worldwide population growth. By means of irrigation, fertilizer, pesticides, and plant breeding, the Green Revolution increased world grain production by an astonishing 250 percent between 1950 and 1984, raising the calorie intake of the world’s poorest people and averting serious famines. The revolution’s benefits have tapered off, however, as the number of mouths to feed has grown ever larger and as conventional breeding of new plant varieties has produced diminishing returns. What’s needed is a new revolution. Luckily, most agricultural scientists believe that the planet’s requirements for agricultural production could be met through genetic modification (GM)—if environmental activists don’t keep it from happening.”- Dr. Swaminathan*

The Green Revolution within India commenced in the early 1960s that led to an increase in food grain production, especially in Punjab, Haryana, and Uttar Pradesh. Major milestones in this undertaking were the development of high-yielding varieties of wheat, and rust resistant strains of wheat.

India is an agricultural country more than 70 per cent of population is dependent on agriculture. Rainfall is the predominantly source of water for agriculture. 40 million hectares lands in India have danger of flood. Almost 20 per cent of the total land of the country lies in the dry farming. Spread over some parts of country of Maharashtra, Gujarat, Andhra Pradesh, Uttar Pradesh, Madhya Pradesh, Tamil Nadu, Haryana, Rajasthan and Karnataka. The country experiences flood and drought every year in one part or other.

After the death of Marotrao Kannamwar, Naik was elected Chief Minister of Maharashtra, a post which he held for more than eleven years during 1963-1975. He is considered the father of the Green Revolution in Maharashtra. The industrialization of Maharashtra is largely the legacy of his progressive industrial policies.

The present investigation was undertaken to evaluate the process of agricultural development by way of studying the changes in the land use and crop pattern, growth rates in area, production and productivity of major crops and to identify the factors influencing agricultural production during the period from 1970-71 to 2010-11 in Sangli district.

The time series data covering the above period relating to the aspect of the study were collected from the published literature as well as from relevant sources. The data were analyzed by adopting suitable analytical tools to arrive at the following results. The study revealed that, the irrigated area increased by 129.65 per cent while the un-irrigated area declined by 21.72 per cent



during the entire period under study. The net sown area showed decreasing trend by 4.79 per cent and gross cropped area also decreased by 1.19 per cent to the total geographical area.

This research approach is utilized as a long term crop management in the study region. These suggest plan to changes in the study region of land use land cover pattern, nature complex, region variation, achieved high quality to extent, water imbalances, environmental crises and its future prediction. These help in planning and development of sustainable land for use. To generate suggest disaster master plan for the Sangli district.

## 2. Selections And Justification Of The Topic And Region

World suffered the highly complex situation of the climatic phenomena Perceived an increasing number of crop. They intimidate the lives and livelihood of a huge scale of the population and have a negative impact on local and regional economies. The process of nature as well as human activities has played a vital role in aggravating the problems due to important facing to the morphology, hydrology, ecology and habitat of an area.

Land under cultivable waste and cultivable fallows showed increasing trend. The land under non- agricultural use increased by, 79.06 per cent. The cropping pattern showed the predominance of food grains crop in district. The commercial crop sugarcane showed continuous increasing trend in area. A contrary was the trends noted in area in case of food grains crop in district. The study brought an important fact that, the new technology available during post green revolution period help to improve the productivity of crops viz., wheat, jowar, maize, gram and red gram.

As a result, the rate of increase in the production of food grain was more in post green revolution as compare to that in pre green revolution period. It is concludes that, from the study the factors viz., consumption of total fertilizer (NPK) per hectare of gross irrigated area in kg (X2), per cent of area under commercial crops to gross sown area (X5), percentage of area of HYV seeds to gross sown area (X4), area under fruits crops in hectares (X8) and number of milk animals (X9) have shown a significant positive association with the increase in the value of aggregate crop output in Sangli district. The important policy implications made on the basis of the present investigation are maintaining forest area, expansion of irrigated facilities, supply of fertilizers and proper supervision on the use of credit, the area expansion of HYV's may be properly supervised for its best utilization in agriculture.

The use of agronomical and mechanical measures for harvesting rainwater for development of agriculture in Sangli district. By knowing the importance of this kind of studies the present research work is related to "*GREEN REVOLUTION FOR SANGLI DISTRICT (MH): A GEOGRAPHICAL STUDY*".

## 3. Objectives

The present study has addressed the green revolution improved by Sanagli district. The main objective of the present study is to suggest comprehensive plan for the green revolution management plan for the drought area and to suggest high agriculture production, using new technology, making a self-marketing, export yield, bulk production, mix cropping pattern etc. due to ground study displaying, documenting, and analysing of agriculture area using information for the efficient crop management. Generation of spatial database and its analysis was performed with following objectives.

1. To examine the Geography personality of the study area.
2. To find out Impact of green revolution position for respective areas.
3. To study socio- economic and cultural impacts of green revolution.
4. To take review of green revolution measures and to evacuate drought affected peoples at Jat, K-Mahnkal, Tasgaon, Miraj, and Vita-Khanapurin Sangli district.
5. To generate statistic model for market condition, using technology, cropping pattern, improve facility, transportation of the study area to utility in green revolution planning.
6. To suggest preventive measures for impact and effect for the study region.

## 4. Data Processing Methodology

For present research work different types of data collection method to utilized particular application analysis. First define the problem of study area then pre investigation for the Geography period and field, then collection of data based upon both primary and secondary sources of data. The primary data consist of causes and consequences of green revolution collected through the well-



structured questionnaires as well as field investigation observation and face-to-face interview review and reconnaissance including cross-check.

The primary data collection the causes and consequences of green revolution, the random sampling method for the study at micro level. The stratified and random sampling method is used for the selection of agriculture field to collect the real data related to impacts of the green revolution during the year 1970-71 to 2010-11. During the field investigation observation and face-to-face interview for informal personal communications to feel the real ground Geography phenomena thus purpose of the used data processing method attempt to qualitative and quantitative analysis.

Secondary data collected from various books, journals, statistical abstracts, socio-economic review and district reports published by Government and Non-Government Organisations etc. Few secondary data collected from some unpublished records, articles, newspapers etc. Web browser is the most important sources of collection secondary data. The collected various document and records from tehsil and collector offices. The following specifications are related to secondary data collected sources.

1. Reports of the Collector Office, Sangli District.
2. Reports of the Public Work Department (PWD) of Sangli District.
3. Reports of the Sangli District Council, Health Department.
4. Socio-economic Review and Statistical Abstracts of Sangli District- 2009 and 2011.
5. Statistical abstract of Sangli District of the Zila Parishad Sangli.
6. Census of India (2011): District Census Handbook of Sangli District.

## 5. Impacts of Green Revolution

The projects within the Green Revolution spread technologies that had already existed, but had not been widely used outside industrialized nations. These technologies included pesticides, irrigation projects, synthetic nitrogen fertilizer and improved crop varieties. Developed through the conventional, science-based methods available at the time.

### 5.1. Food Security:

The world population has grown by about four billion since the beginning of the Green Revolution and many believe that, without the Revolution, there would have been greater famine and malnutrition. India saw annual wheat production rise from 10 million tons in the 1960s to 73 million in 2006. The average person in the developing world consumes roughly 25% more calories per day now than before the Green Revolution. Between 1950 and 1984, as the Green Revolution transformed agriculture around the globe, world grain production increased by over 250%. The production increases fostered by the Green Revolution are often credited with having helped to avoid widespread famine, and for feeding billions of people.

### 5.2. Quality of diet:

Green Revolution agriculture produces monocultures of cereal grains, while traditional agriculture usually incorporates polycultures. These monoculture crops are often used for export, feed for animals, or conversion into biofuel. According to Biodiversity International, the Green Revolution has also led to a change in dietary habits, as less people are affected by hunger and die from starvation, but many are affected by malnutrition such as iron or vitamin-A deficiencies. Fresno further asserts that almost 60% of yearly deaths of children under age five in developing countries are related to malnutrition.

### 5.3. Socio-economic impacts:

Smaller farmers often went into debt, which in many cases results in a loss of their farmland. The increased level of mechanization on larger farms made possible by the Green Revolution removed a large source of employment from the rural economy. Because wealthier farmers had better access to credit and land, the Green Revolution increased class disparities. The rich - poor gap widened due to that. Because some regions were able to adopt Green Revolution agriculture more readily than others (for political or geographical reasons), interregional economic disparities increased as well. Many small farmers are hurt by the dropping prices resulting from increased production overall.

### 5.4. Globalization:

In the most basic sense, the Green Revolution was a product of globalization as evidenced in the creation of international agricultural research centers that shared information, and with transnational funding from groups like the Rockefeller Foundation, Ford Foundation, and United States Agency for International Development (USAID). Additionally, the inputs required in Green

Revolution agriculture created new markets for seed and chemical corporations, many of which were based in the United States. For example, Standard Oil of New Jersey established hundreds of distributors in the Sangli to sell agricultural packages composed of HYV seed, fertilizer, and pesticides.

## 6. Conclusion

Technology forms an integral part of a total agricultural development system. The present population growth rates have provide the food it's a necessary. Especially in the developing world, the implementation of improved technologies are essential in increasing the food production. Sangli district applied the green revolution to increased agriculture production. The conclusion on the literature on technology transfer and adoption with women farmers was that the importance of women farmers and their specific role in the developing agriculture was not acknowledged in the planning and development stage of new technologies. Effective extension services with a good extension approach and well-trained and experienced farmer would put pressure on the research systems to become more demand-oriented food quality and quantity with new technologies.

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## Impact Of Agro-Inputs On Quality Of Soil From Agricultural Lands Of Shirol Teshil, Kolhapur District (M.S.), India

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### Abstract

Present attempt is made to reveal the impact of agro inputs on the quality of soil and water. The study dealt with various soil parameters like Nitrogen, Phosphorous, Potassium, alkalinity, pH, EC and wasteland status. The study can be concluded that over use of agro inputs were leading agro lands into waste lands. During the study period, mismanagement of fertilizer application and irrigation system was noted.

**Key words:** - Impacts, agro-inputs, soil, water, quality

### 1. Introduction:-

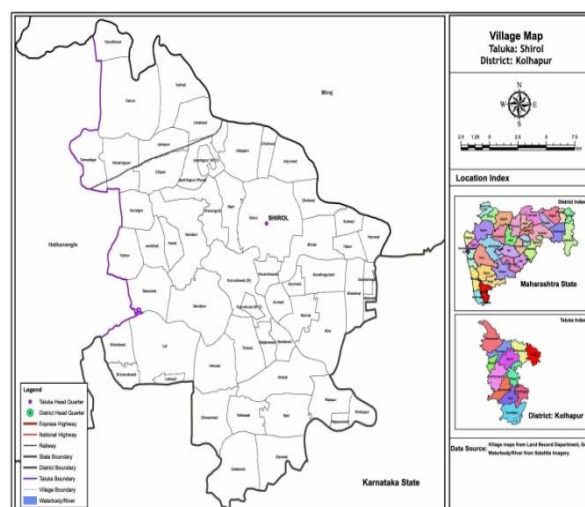
In one sense, a soil is considered to be a three-dimensional piece of landscape having shape, area, and depth. The soil environment is dominated by a solid phase composed of inorganic minerals, plant and animal residues in various stages of decay, and a living and metabolizing micro-biota (Stotzky, 1971). From the agricultural point of view, it is an unconsolidated mineral or organic material that is on the surface of the earth in which plants are grown. There are two important aspects as far as soil properties are concerned. First is its hydraulic conductivity, the ability of the soil to manage, hold, and drain water. Second, its nutrient management, which in addition to the above-mentioned factors, analyzes the organic matter content, cation exchange capacity, and coatings on sand grains.

### 2. Objectives :-

1. To study agro inputs in the study region.
2. To study physical and chemical parameters of soil with reference to agro inputs.
3. To identify the proportion of wasteland with respect to agro lands.

### 3. Location Of Study Region

India is a predominantly agricultural nation, and Maharashtra state in India occupies an important position which ranks third in area and second in population. Kolhapur district is divided mainly into two parts, the eastern and the western. The eastern side covers Shirol, Hatkanangale, Karveer, and Kagal tahsils. The western side covers Panhala, Shahuwadi, Gaganbawada, Radhanagari, Ajara, and Chandgad Tahsils. In the present study, Shirol tehsil was selected as the study area for investigation, which is one of the developed tehsils in Kolhapur district. It is situated from 16.37° N to 16.52° N latitudes and from 74.27° E to 74.42° E longitudes. It has 507.9 sq. km of land constituting 6.15% of the geographical area of the Kolhapur district. The population is 4,10,136 lakh, and the density is 707 per sq. km as per the census of 2011. There are 54 villages and 02 municipalities. Territorially, Shirol tehsil has Sangli district to its north, Belgaum district of Karnataka state to its south, and east while Hatkanangale tehsil to its west. Shirol taluka is a vast plain area sloping eastward and bounded by the Krishna, the Panchganga, the Dudhganga, and Warana rivers. The distinguishing features of the topography of the taluka are unlike the Deccan plateau, with an average height of 600 meters above the sea level. 41 villages from Shirol taluka are located in plain areas. (Koli & Pujari, 2018)



#### **4. Soil quality and fertility**

A fertile soil contains all the major nutrients for basic plant nutrition (e.g., nitrogen, phosphorus, and potassium), as well as other micronutrients like calcium, magnesium, sulfur, iron, zinc, copper, boron, molybdenum, nickel. All these nutrients play a vital role in plant growth and plant productivity. Usually a fertile soil will also have some organic matter that improves soil structure, soil moisture retention, nutrient retention and maintains pH between 6 and 7. (Shinde, 1987) Unfortunately, many soils do not have adequate levels of all these necessary plant nutrients, which are unfavorable for plants.

Soil fertility is interested in managing nutrients to improve crop production. They focus on using commercial fertilizers, manures, waste products and composts to add nutrients and organic matter to the soil. Sometime they also add chemicals that change the pH to a more optimum level for nutrient availability to plants. Soil fertility experts must also be careful to ensure that practices are environmentally sustainable. Inappropriate management of nutrients can lead to contamination of lakes, rivers, streams, and groundwater. In addition, adding amendments to the soil is expensive and cuts into the profitability of farming operations, not to mention that toxic levels of nutrients can be as bad as or worse than too little nutrients for the plants.

#### **5. Nitrogen Content in Soil:**

The rate of plant growth is proportional to the rate of nitrogen supply. If the soil is deficient in Nitrogen, the plants become stunted and pale (Jadhav, 1979). However, an excess of Nitrogen can damage the plants just as over-fertilizing the lawn can burn and damage the grass.

Values of soil nitrogen supply can be classed into one of five descriptive categories from "Very Low" to "Very High". The higher the value for soil nitrogen supply the more likely it is that the microorganisms in a soil will convert more organic nitrogen into mineral nitrogen for plant uptake.

However, in coarse textured soils with higher values of soil nitrogen supply, it is also more likely that nitrate will be leached down the soil profile out of reach of plant roots and possibly into waterways. Intermediate levels of soil nitrogen supply provide a balance between maximizing nitrogen availability for plant uptake and minimizing the risk of nitrate leaching.

The level of soil nitrogen supply that best balances the benefits and risks varies depending on the clay content of soil. In sand soils, the best balance is achieved by a "Moderate" soil nitrogen supply (25 – 50 mg-N/kg soil). In contrast, in loam and clay soils "High" soil nitrogen supply is most suitable (50 – 75 and 75 – 125 mg-N/kg soil respectively).

#### **5.1.High Nitrogen Content**

The soil containing more than 0.70% organic carbon are included in this category these soil dominated the spatial distribution with 51.78% area. Such soil are observed in Jaysingur (55.24 %), Shirol (52.93%), Nandani(47.62%), Narsobawadi (45.70%), Kurundwad (51.43%) Shirodhon (59.70%) and Dattwad (50%) circles. This soil is largely confined to the nearby region of stream and rivers and mostly used for sugarcane cultivation with overdoses of chemical fertilizer and heavy sedimentation. (Fig. 6.1)

#### **5.2. Moderate Nitrogen Content**

The soil containing 0.5 to 0.7% organic carbon is known as moderately nitrogen content soils, which covers 31.25% of the study region. Such soil was observed in Jaysingur (30.48 %), Shirol(30.39%), Nandani(33.33%), Narsobawadi (33.33%), Kurundwad (32.28%) Shirodhon (27.84%) and Dattwad (31.11%) circles.

#### **5.3. Low Nitrogen Content**

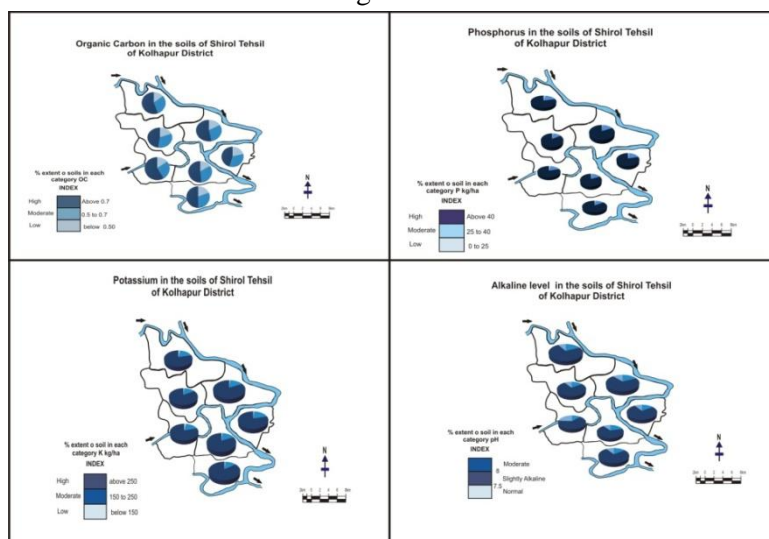
The soil containing less than 0.50% organic carbon is grouped in this category covering 17.38% area. This soil is observed in Jaysingur (14.29 %), Shirol(16.67%), Nandani(19.05%), Narsobawadi (21.14%), Kurundwad (16.19 %) Shirodhon (15.46%) and Dattwad (18.89%) circles.

## 6. Phosphorus Content in soil (P)

Phosphorus is an essential element classified as a macronutrient because of the relatively large amounts of Phosphorus required by plants. One of the main roles of Phosphorus in living organisms is in the transfer of energy. Organic compounds that contain P are used to transfer energy from one reaction to drive another reaction within cells. Adequate P availability for plants stimulates early plant growth and hastens maturity.

Although Phosphorus is essential for plant growth, mismanagement of phosphorus in soil can pose a threat to water quality. The concentration of Phosphorus is usually sufficiently low in fresh water so that algae growth is limited. When lakes and rivers receive amounts of Phosphorus that exceed their background levels, excessive growth of algae often occurs. Increased levels of algae reduce water clarity and can lead to decreases in available dissolved oxygen as the algae decay. These conditions can be very detrimental to much of the aquatic life and can limit the recreational use of lakes such as game fishing and other water activities.

Fig No.6.1



Source :- Based on field survey

### 6.1. Rich soil (High Phosphorus content)

The soils containing more than 15kg/ha of phosphorous are known as high or rice phosphorus is containing soils. These soils covers 19.09% area of study region. They are observed in the circles of Jaysingur (23.16 %), Shirol(19.18%), Nandani(19.35%), Narsobawadi (16.28%), Kurundwad (17.27 %) Shirodhon (20.93%) and Dattwad (17.5) (Fig. 6.1)

### 6.2. Moderate soil (Moderate Phosphorus content)

The soils containing 10 to 15 kg/ha of phosphorus are regarded as moderately phosphorus containing soils. These soils occupy 19.36% area in the study region. The distribution of this type of is as, Jaysingpur (21.05%) , Shirol (17.81%), Nandani(21.51%), Narsobawadi (18.60%), Kurundwad (1954 %) Shirodhon (23.26%) and Dattwad (13.75%).

### 6. 3. Poor soil (Low Phosphorus content)

The soil containing less than 10 kg/ha of phosphorus known as low or poor phosphorus containing soil. They occupy 61.50% area in the study region. these soil are found in of Jaysingur (55.79 %), Shirol(63.01%), Nandani(59.14%), Narsobawadi (65.12%), Kurundwad (63.22 %) Shirodhon (55.51%) and Dattwad (68.75%).(Fig. 6.1)

## 7. Potassium Content in Soil

### 7.1.High Potassium Content

The soils containing more than 250kg of potassium per hectare fall in this category covering 84.74% area in the study region dominating almost all the study area. Above 80% of thesis soils are found in the circles of Shirol, Nandani, Kurundwad and Dattwad. The soil having potassium below 80% area observed in the circles of Jaysingpur, Narsobawadi and Shirdhon.



## 7.2. Moderate Potassium Content

The soil containing potassium 150 to 250 kg/ha. is included in this category. They cover 16.42% area of the study region. This type of soil is found in circles of Jaysingpur (18.06 %), Shirol (16.00%), Nandani (14.29%), Narsobawadi (19.40%), Kurundwad (16.67 %) Shirodhon (17.33%) and Dattwad (13.24%).(Fig. 6.1)

## 7.3. Low Potassium Content

The soil containing less than 150kg/ha. of potassium is known as low category. The soil covers only 1.83% area in the study region. The soils having potassium above 2% area observed only in two circles i.e. Jaysingpur (2.78%) & Shirodhon (2.67%). The soils having potassium below 2% are found in Shirol, Nandani, Narsobawadi, Kurundwad and Dattwad circles.

## 8. Soil quality by Alkalinity

On the basis of pH measurement. The rate of plant nutrient released by weathering, the solubility of all minerals in the soil and amount of nutrients on the cation exchange sites are influenced by soil pH.

### 8.1. Normal Soils

In general, soil with pH values ranging from 6.5 to 7.5 are considered to be normal alkaline soils. A pH value near to the neutral value is best suited for most of the plant growth. When pH value is in between 6.5 to 7.5 then all the plant nutrient are available satisfactorily. In the study region, near about 16.66% of the soil falls in the normal alkaline category. The high percent (above 18%) of the soils are confined to the circles of Narsobawadi and Kurundwad, where intensity of irrigation is low. The moderate percent (16-18) of these soils are noted in the circles of Jaysingpur and Shirol. The low percent (below 16%) of these soils are observed in the circles of Shirodhon, Dattwad and Nandani, where intensity of irrigation and sugarcane cropping is high. In these circles also high proportion of black soils are found

### 8.2. Slightly Alkaline Soils

Near about 70.95 % of soils have pH value between 7.6 to 8 which indicates the nature of soil is slightly alkaline. The high percent (above 75%) of these soils were observed in the circles of Nandani and Dattwad. The moderate percent (70-75%) of these soils were noted in the circles of Jaysingpur and Shirol. The low percent (below 70%) of these soils was confined to the circles of Narsobawadi, Kurundwad and Shirodhon.

### 8.3. Moderate Alkaline soils

About 12.36% of soils have pH value between 8.1 to 8.5 which indicates the moderate alkaline nature of the soil. The high percent (above 20%) of the total area of these soils were noted in the circle of Shirodhon only. The moderate percent (10-20 %) of these soils were observed in the circles of Shirol, Narsobawadi and Kurundwad. The low percent (below 10%) of these soils are found in the circles of Jaysingpur, Nandani and Dattwad.

## 9. Soil quality by salinity

### 9.1. Normal Category

In the study area, the analysis of soil quality reveals that, about 44.83% of the soil in the normal category which is well suited for plant growth. The high percent (above 60%) of this category of soils are found in the circles of Shirol and Nandani, where intensity of irrigation is low and natural drainage is adequate. The moderate percent (30 to 60 %) of this category of soils are observed in the circles of Narsobawadi, Kurundwad and Shirodhon. The low percent (below 30%) of this category is noted in the circles of Dattwad and Jaysingpur where intensity of irrigation and sugarcane cropping is high. Also in these circles high proportion of low drained black soils are predominate.

### 9.2. Critical for germination category

In study region during investigation, it was found that near about 39.17% of soils fall under critical for germination category. The high percent (above 50%) of this category of soil was noted in the circles of Dattwad and Jaysingpur. The moderate percent (40-50%) of this category of soil was confined to the circles of Narsobawadi, Kurundwad and Shirodhon. The low percent (below 40%) of this category was observed in the circles of Shirol and Nandani. The analysis reveals that continuous mono cropping of sugarcane, excessive water use and fertilizer consumption, absence of drainage in



the field, slope of land; fine clay soils are the factors which are responsible for the beginning of salt-affected soils.

### 9.3. Injurious category

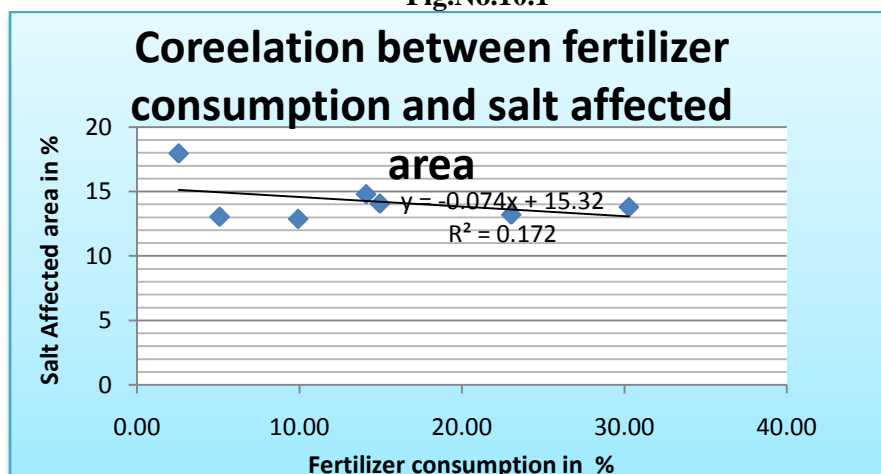
In the study region, only 15.99% of soil is in injurious category. The high percent (above 18%) of this soil was noted in Narsobawadi and Dattwad circles. In these circles, saline soil occurs in the irrigated tracts where excessive use of irrigation water along with more application of fertilizer is made. This results into reverse of water table to permit concentration of salts from saline ground through evaporation. The moderate percent (10-18% ) of this category of soil was observed in the circles of Shirdhon, Shirol and Jaysigpur. The low percent (below 10%) of this soil was confined to the circles of Kurundwad and Nandani.

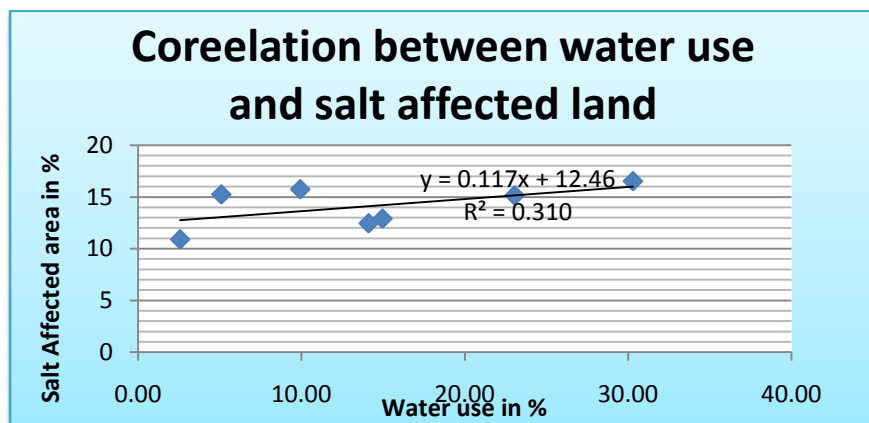
The poor drainage also keep the salt contents. Within the surface layer of soils. In the study region, salinity of soil is a man-made problem which is result of ignorance of farmers towards, the balanced utilization of water and fertilizer. The formation of salts in the root zone of plants will hamper crop growth and its productivity as well.

### 10. Regional distribution of salt effect wasteland

Since from last few years, emergence of salt affected wasteland have been observed in some parts of study area. Due to very gentle slopes and fine clay loams, excessive water use and fertilizer consumption have made the land, susceptible to salt accumulation. Also absence of surface drainage in the fields restricts water movement within the soil which results in upward movement of salt due to capillary action. Due to water logging and rising water level adversely affected the agricultural land in the irrigated area of study region. Hence due to water logging and salinity problem, some amount of agricultural land in the study area is turing into waste land. The salt affected area is about 3.76 % of total cropped area which is known as saline wasteland in study area. In the study region, the problem of salt affect wasteland is too severe and many sugarcane filed turned into saline wastelands. The high percent (above 20%) of wastelands are observed in the circles of Jaysingpur and Shirol occupying 53.34% area in the region. in this region, Intensity of irrigation and intensity of sugarcane cropping are high. Which provide a land for erratic water use. The actual average water use by the sugarcane crop is 445 ha.cm. which is more than the standard requirement of sugarcane crop (300 ha.cm) and the average per hectare fertilizer use by the sugarcane crop is 837 kgs/ha. which is also more than standard requirement of of fertilizer (600 kg/ha) (govt. of Maharashtra 1985). The salt affected land or wastelands have become common in sugarcane belt or cultivated area. The moderate percent of (10-20%) salt affected wasteland, are found in Kurundwad ,Narsobawad. It accounts 29.07% area of the study region. Hence input consumption is also moderate in these area. The average per hectare water use for sugarcane is 410 ha.cm. and average per hectare fertilizer use is 808 kg/ha. which isalso higher than standard requirement. The low percent (below 10%) of wasteland are confined to the circles of Dattwad, Nandani and Shirdhon. these circles have well drained coarse and shallow soil zone. It amounts 17.59 % area of the study region. In this region intensity of irrigation is low and hence consumption of agrio-inputs are also low. Here the average per hectare water use by sugarcane crop is 361 ha.cm. while average per hectare fertilizer use is 764 kg/ha. (Fig.No.10.1)

Fig.No.10.1





Source: Based on field survey

## 11. Salinity (E.C.)

### A) Low Salinity areas:-

E.C. values below 0.25 mmhos are known as area of low salinity category. low salinity water can be used for irrigation to cultivate most of the crops on most of the soils. But this type of category is observed only in Dattwad circle of study area, accounting 11.60% area. In sugarcane belt, underground water is saline due to excessive use of irrigation water and chemical fertilizer so, most of water falls under moderate to high salinity category.

### B) Moderate Salinity areas:

Moderate salinity water with EC ranging between 0.25 to 0.75 mmhos is observed in Shirdhon, Jaysingpur, Narsobawadi and Nandani circles, accounting 52.10% area of the study region, if a moderate amount of leaching occurs under current irrigation process. (Fig. 6.1)

### c) High Salinity areas:-

High salinity water with EC ranging between 0.75 to 2.25 mmhos are found in the circles of Shirol and Kurundwad occupying 36.30% area of study region. This type of water suitable for irrigation on soils which area provided with goods drainage.

### D) Very High Salinity area :-

Soils having EC values above 2.25 mmhos are considered as very high salinity category, this types of water cannot be directly used for irrigation, this types of category is not observed in study area.

## 12. Alkalinity (pH)

The important factor in biological and chemical system of neutral water is known as pH. pH is the negative logarithm of hydrogen ion concentration. It gives information about the alkalinity and acidity of water. The pH is one of the parameters to assess the water whether it is suitable for irrigation or not based on its values. Changes in the pH value may affect the toxicity of many compounds. The analysis of water samples in the study region shows that average pH value of ground water is 7.48. Most of water samples in study area were alkaline in natural with pH value ranging between 7.22 to 8.15.

### A) Area of neutral water

Areas having pH ranging between 7 to 7.5 area observed in the circles of Jaysingpur and Dattwad, occupying 18.31 % area of the study region.

### B) Areas of moderate alkaline water

The pH value of water ranging between 7.5 to 8 are are known as mild alkaline water. This type of water is found in the circles of Shirol, Shirdhon and Kurundwad accounting 73.21% of study region.

### C) Areas of strong alkaline water.

Areas with strong alkaline water with pH value above 8.5 are observed in circles of Narsobawadi and Nandani accounting 8.48% area of study region.

### 13. Conclusion

In the present study it can be concluded that excess use of agri inputs like over dose of fertilizers and over irrigation leading soil towards salinity. It can also be concluded that among all circles, Jaysingpur and Shirol circles hold most of its area under waste land. Finally improper management of fertilizer application and irrigation methods used study in the area leading agricultural land in to wastelands.

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## The Role Of Dairy Co-Operative Societies In Rural Development

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### Introduction:

Right from the earliest times working and living together that is through co-operation mark the progress and development of human beings in all spheres - social, economic, religious and political. Co-operatives are "autonomous associations of persons united voluntarily to meet their common economic and social needs through jointly owned and democratically controlled enterprises." Any association of persons, or of societies, shall be recognized as a co-operative society, provided that it has for its object the economic and social betterment of its members by means of an enterprise based on mutual aid, and that it conforms to the ICA Statement on the Co-operative Identity, as approved by the General voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise.

Co-operatives are based on the values of transparency, self-help, self-responsibility, democracy, equality, equity and solidarity. In the tradition of their founders, co-operative members believe in the ethical values of honesty, openness, social responsibility and caring for others.

### Objectives Of The Study:

- 1) To examine the contribution of dairy co-operatives to rural development.
- 2) To study the role of DCS's in rural income generation.
- 3) To find out the economics of milk production.

### Methodology:

The data required for this paper has been collected from the primary and secondary sources.

### Primary Data:

For this paper I took a sample size of 100 respondents for the survey, from 10 different villages of Hatkangale taluka, district Kolhapur. Data was collected through questionnaire and interview method. The farmers were divided into five groups i.e. Big farmers, Medium farmers, Small farmers, Marginal farmers and Land less labourers. It was ensured that from each village two respondents were studied from each group, i.e. total villages were 10, and 2 respondents from each groups for one village that means from every village 10 respondents.

### Secondary Data:

This includes secondary information in which theoretical data was required that was collected by reviewing literature from diverse sources on the topic. This has made it possible to impart a comprehensive view to this paper.

### Principles Of Co-Operation:

This system of accepting a fair share of the risks and benefits of their co-operative undertakings is based on some well-known principles which are given by ICA. The principles of co-operation are guidelines by which co-operatives put their values into practice as follows.

#### 1. Voluntary and Open Membership

Cooperatives are voluntary organizations, open to all persons able to use their services and willing to accept the responsibilities of membership, without gender, social, racial, political, or religious discrimination.

#### 2. Democratic Member Control

Cooperatives are democratic organizations controlled by their members, who actively participate in setting policies and making decisions. The elected representatives are accountable to the membership. In primary cooperatives, members have equal voting rights (one member, one vote) and cooperatives at other levels are organized in a democratic manner.

#### 3. Members' Economic Participation

Members contribute equitably to, and democratically control, the capital of their cooperative. At least part of that capital is usually the common property of the cooperative. Members usually receive limited compensation, if any, on capital subscribed as a condition of membership. Members allocate surpluses for any or all of the following purposes: developing the cooperative, possibly by setting up reserves, part of which at least would be indivisible; benefiting members in proportion to their transactions with the cooperative; and supporting other activities approved by the membership.

#### 4. Autonomy and Independence

Cooperatives are autonomous, self-help organizations controlled by their members. If they enter into agreements with other organizations, including governments, or raise capital from external sources, they do so on terms that ensure democratic control by their members and maintain their cooperative autonomy.

#### 5. Education, Training, and Information

Cooperatives provide education and training for their members, elected representatives, managers, and employees so they can contribute effectively to the development of their cooperatives. They inform the general public, particularly young people and opinion leaders, about the nature and benefits of co-operation.

#### 6. Cooperation Among Cooperatives

Cooperatives serve their members most effectively and strengthen the cooperative movement by working together through local, national, regional, and international structures.

#### 7. Concern for Community

Cooperatives work for the sustainable development of their communities through policies supported by their members.

The concept of co-operation has been effectively employed in various walks of life. These include credit, marketing, production, processing, dairying and others. In the Indian context especially, Dairy Co-operative Societies (DCSs) are offering meaningful solutions to rural problems like unemployment, poverty etc.

**Benefits Of Dairy Co-Operatives :** A dairy co-operative is a form of organization wherein persons voluntarily associate together as human beings on a basis of equality for the promotion of economic interests of the members. By working together these members aim at getting the following benefits:

**Economic Benefits :** The Dairy Co-operatives in India have been rendering invaluable service for the economic betterment and well being of the rural population. In certain parts of the country like Maharashtra, Gujarat, Tamilnadu and Karnataka the growth of co-operatives has brought about overall prosperity to the villagers. Members of such villages are no longer in debt; in fact they have some surplus, which they intend to reinvest. Some of the economic benefits provided by the dairy co-operatives can be stated as under:

**Cheap Credit :** Dairy Co-operative Societies (DCSs) provide cheap credit to the members. Before the advent of the movement the rural people had to pay exorbitant rates of interest on loans from the moneylenders. The All India Rural Credit Review Committee (1969) has stated "There is reason to believe that there has been a decline in the rates charged by private agencies in parts of the country and that an important reason for this is the competition offered by co-operative credit at relatively low rates of interest".

**Rescuing the Peasantry from the Clutches of Moneylenders :** Co-operatives in India have liberated millions of farmers from the clutches of moneylenders. The old saying that, "Indian farmers are born in debt, die in debt, leave the debt for future generation" does not hold well in those villages where co-operatives have been successful. According to the latest estimates, about 40 per cent of credit needs are being met by co-operatives.

**Better Use of Credit :** Dairy Co-operatives largely provide credit for productive purposes like purchase of milch animals, feeds etc. This has substantially increased the investment capability of the people in rural areas.

**Popularizing Modern Inputs :** Dairy Co-operatives are playing a useful role in popularizing the use of various modern inputs such as improved breeding, artificial insemination (AI), veterinary services, feed supply at low prices etc., and are thus realizing the ideal of "better farming, better business and better living."

**Provide a Fillip for Thrift :** By developing economically strong milk producers' families, the rural economy gets transformed and immensely strengthened. This should encourage rural savings, investment and banking habits among the rural people.

**Social And Moral Benefits :** The Dairy Co-operative movement has brought about a number of social and moral benefits to the members and also to the community. There are as follows:

It teaches to live harmoniously on a community base. It teaches the lesson of unity, brotherhood and corporate feeling. Self help and mutual help, 'you for me, I for you and we for all'. As co-operation relies on the character of the members, it fosters a sense of responsibility, integrity



and diligence. The Dairy Co-operative movement is bringing about socio-economic changes in the society without resorting to undesirable method and violence.

H. Wolf stated, "As an effect of co-operation the idle man becomes industrious, the spendthrift thrifty, the drunkard reforms his ways and becomes sober, the illiterate learns to read and write."

**Educational Benefits :** Dairy Co-operatives provide the following educational benefits.

- Dairy Co-operatives create in the members a desire for education.
- They provide valuable training, which is necessary to run dairy activities.
- Some Dairy Co-operatives run Schools for providing general and technical education.

**Data Analysis :**

For this paper required primary all data of milk producers in collected from Kolhapur district, Hatkangale taluka's 10 (ten) different villages and sample size in 100 (hundred).

**Table No. 1**  
**Occupation Pattern among the Respondents in the Study Area**

Farmers Category	Farming		Dairy		Other	
	Main	Subsidiary	Main	Subsidiary	Main	Subsidiary
Big Farmers	27(41.04)	--	--	20(23.53)	--	--
Medium Farmers	22(37.04)	--	--	20(23.53)	--	--
Small Farmers	07(09.11)	06(100)	05(33.33)	15(17.65)	09(29.03)	--
Marginal Farmers	09(12.8)	--	03(20)	17(20)	09(29.03)	04(40)
Land Less	--	--	07(46.67)	13(15.29)	13(41.94)	06(60)
<b>Total</b>	<b>65(100)</b>	<b>06(100)</b>	<b>15(100)</b>	<b>85(100)</b>	<b>31(100)</b>	<b>10(100)</b>

From the above table it is seen in the study area that, for Big and Medium Farmers farming is their main business and they accept the dairy business as subsidiary, but for some respondents in category the Small, Marginal and Land less labours dairy is the main business, and subsidiary business or other or vice versa.

**Table No. 2**  
**The No. of Livestock's in their home**

Farmers Category	Up to 3	4to 6	7 to 9	10 & Above	Total
Big Farmers	11(35.48)	04(12.9)	04(15.38)	01(8.33)	115(18.91)
Medium Farmers	05(16.13)	07(22.58)	07(26.92)	01(8.33)	130(21.38)
Small Farmers	04(12.9)	07(22.58)	05(19.23)	04(33.33)	145(23.85)
Marginal Farmers	04(12.9)	10(32.26)	04(15.38)	02(16.67)	127(20.89)
Land Less	07(22.587)	03(9.68)	06(23.08)	04(33.33)	91(14.97)
<b>Total</b>	<b>31(100)</b>	<b>31(100)</b>	<b>26(100)</b>	<b>12(100)</b>	<b>608(100)</b>

In the area under study, for the Big and Medium farmers the main business is farming and so they have less number of milch animals in their homes. (most of the big farmers have 2-6 animals). But for other farmers they have 5-10 animals in their homes. In the area of study all respondents have total 608 animals and highest animals are held by small farmers i.e. 23.85% and the landless are having just 14.97% live stock, which is the lowest.

**Findings And Suggestions :**

**Findings :** Big and Medium farmers are looking to dairy as an additional income source for their family, where as the some of the respondents from other category's are doing dairy as a main business.



Still most of the respondents are using family members for the dairy and very less respondents are using hired labour.

Most of the respondents are using buffaloes for the milk production and cows are very few.

Due to the good and timely veterinary aid milk production is on the rise.

Twice or thrice a year most of the DCS in the study area arrange medical check up camps for the animals of the DCS members and in this camp the charges are lower than at other times so all the respondents take the benefit of this facility.

Trend of retaining the milk for home consumption is very less which means that the respondents have 0.5 or 1 litre milk for home consumption and they try to sell the milk to DCS or others to increase their income.

Also at times respondents try to sell maximum milk to the outsiders customers as they get a higher price than the DCS. But in the rural area there is less demand to the milk due to high production of milk.

Rs. 625/- to Rs. 900/- is required for the fodder expenses and Rs. 950/- to Rs. 1,250/- is required for the non-fodder expenses for each animal.

Per liter cost is Rs. 25.87 to Rs. 27.19 among the respondents in the study area, and per litre revenue is Rs. 22.80 to Rs. 24.86.

In this study area land less labours are dominant and get highest net profit per litre and it is possible because in this category seven respondents are in the business of dairy as a main business.

### **Suggestions :**

Small farmers are spending more amounts on the green fodder, so if they make proper utilization of green fodder they can definitely succeed in reducing the cost.

It is found that per litre rate of milk offered by DCS is lower than the rate offered by outsiders. So DCS should try to increase the price.

## A Demographical Over-View Of Kolhapur District In Maharashtra

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### Abstract-

*The present paper based on 2001 and 2011 census date, intends to analyze the demographic profile of Kolhapur district, located in the south-west of Maharashtra state, on the border of Maharashtra and Karnataka states. The population has rapidly increased during 2001-2011. The density of population was 504 per. Sq. km. in 2011. It observed that growth rate was 10.01 percent in during 2011. It is found that the overage sex ratio in the study area was 949 in 2001. Which has increased to 957 in 2011. It is also observed that literacy rate in study area was 76.93 percent in 2001. The male literacy was higher than female literacy in study area. The male literally 88.57 percent and female literally was 74.22 percent in 2001. There are wide disparities between male and female Literacy. The study demographic profile is useful for planning purposes.*

**Key words:** Sex ratio, Growth rate of population, Density of population, Literacy rate.

### Introduction:

India is second largest populace and developing country in the world after china. Nearly 80 percent of the total population of the world is living in the developing countries. Over half of the population compares by china and India. i.e. 40 percent. The rapidly increase of population growth in the developing countries Almost all developing countries of the world are always facing same kind of population problems.

The developing countries like India are characterized by highest growth rate, unemployment law per capita incomes and dependence of a major part of workforce on primary activities, by this country in relation to population are discussed below socio-demographic variables of population

- 1) Distribution of population
- 2) Sex ratio
- 3) Growth of population
- 4) Density of Population
- 5) Literacy rate

**Objectives:** In the ongoing paper following objectives are taken into consideration:

- 1) To analyze the distribution and growth of population in Kolhapur district during year 2001-2011
- 2) To study the density of population and sex composition among the male and females.
- 3) To assess the spatial pattern of literacy at tahsil levels in Kolhapur district 2011.

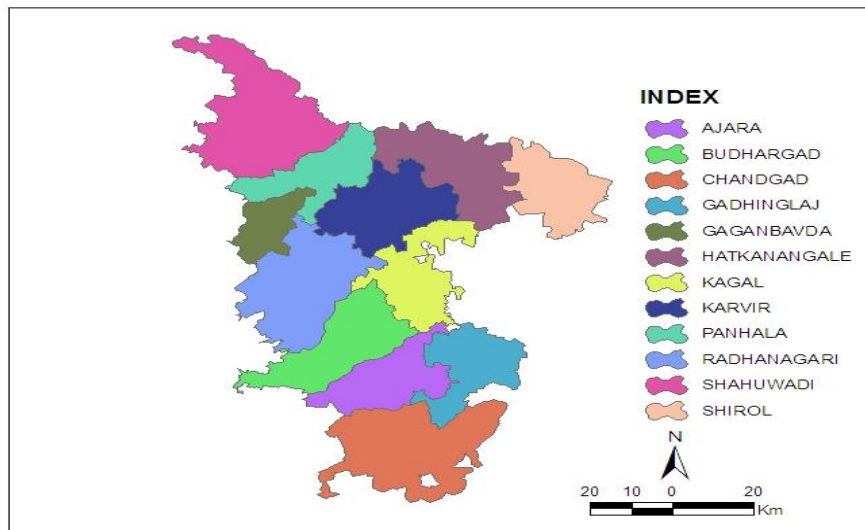
### Study Region:

The district of Kolhapur lies in the south-west of Maharashtra between **15°43'** to **17° 17' North** latitude and **73°40'** to **74° 42' East** longitude and spreads across the Deccan Plateau in the rain shadow region of the Sahyadri mountain ranges on the southernmost tip of the state of Maharashtra. The Sangli district lies to the north, the Belgaum district of Karnataka State is to the east and south, Ratnangiri and Sindhudurg districts of Maharashtra are to the West. To the west, we have the Sahyadri ranges and the river Warana is to the north which forms the natural boundaries to the district. It has an area of 7685.00 sq.kms. Which about 2.5 per cent is of total area of the state and it ranks 24th in the state as far as area is concerned.

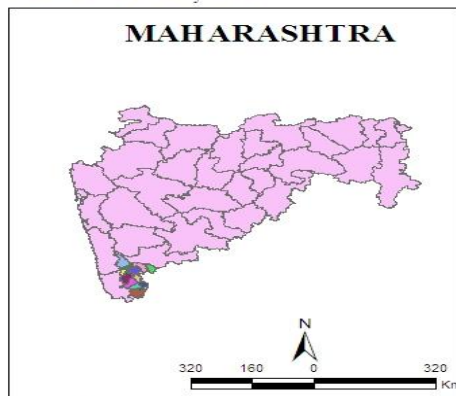
### Physical Setting:

Kolhapur is a part of the Deccan table land .The district interior has a varied economical culture mountain Sahyadri have spread their wings mainly in the western region of the district and this has 57. The ranges of converted part of the district with Konkan type soil and ecology and partly with Deccan type. Although the major portion of the district is 390 to 600 meters above the mean sea level. Some of the points are as high as 900 meters above mean sea level. Kolhapur district is located at the tail end of the Maharashtra state. The principal rivers of Kolhapur district are the Varna, Panchaganga, Krishna, Doodhaganga, Vedaganga and the Hiranyakeshi. The Varna river which has fairly southeastern trend, serves more or less as the boundary between Kolhapur and Sangli districts. The river Krishna's influence on the south the region is Kolhapur District more indirect than direct, though the Krishna controls the drainage region of the Rivers.

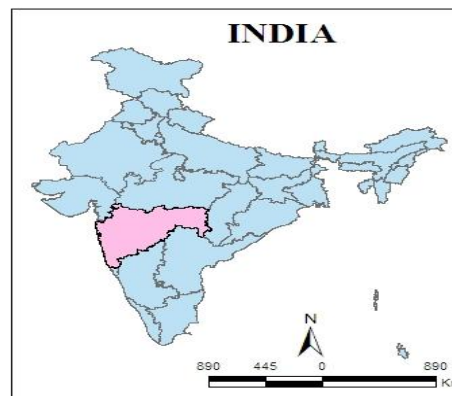
### LOCATION MAP OF STUDY AREA



Source: Based on Survey of India



Source: Based on Survey of India



Source: Based on Survey of India

#### Source of Data :

This study of research is mainly based on secondary data, Its is collected from census of India, socio-economic review and statistical abstract of Maharashtra state and district of Kolhapur. District Census handbook and other various sources of secondary data have been utilized, such as journals, books and internet.

#### Methodology:

The research paper intends to assess the demographic variables at the talhsil levels in Kolhapur district 2001-2011 with indicators of distribution, growth of population, density of population, sex composition, literate population and disparity of literacy.

Talhsil wise simple decable growth rate will be computed by employing the following

#### Formula:

$$\text{Growth Rate} = \frac{P2-P1}{P1} \times 100$$

Where  
 P1 = Population of previous decade  
 P2 = Population of current decade

Total Population per square kilometers of area is called as density of population

$$\text{Density of Population} = \frac{\text{Total Population}}{\text{Total area sq.km.}}$$

Sex ratio is measured in terms of number of females per thousand males i.e.

**Sex Ratio :** Literacy rate is computed for the population above six.

$$\text{Literacy Rate} = \frac{\text{Literate Population}}{\text{Total Population above 6 age}} \times 100$$

To measure the male-female disparity in literacy, Sopher's disparity index modified by Kundu and Rao(1983) will be employed. This formula is given below.

$$Ds = \log\left(\frac{X2}{X1}\right) + \log\left[\frac{(200-X1)}{(200-X2)}\right]$$

In this formula X2 is considered for male and X1 for female literacy rates.

### Distribution of Population:

The population of the district is 3,523,162 in 2001 and 3,876,001 in 2011 respectively i.e. 352839 population is increased in the study region as per the census. Karveer Tahsil is most populous 1,037,713. Other tahsil in order of population size are tahsil Hatkanangle 807,751, Shirol tahsil 391015 and kagal tahsil was observed 275372 respectively.

**Table No.1 Demographic Structure of Population in Kolhapur District**

Sr.No	Name of Tahsil	Distribution of Population (2001)			Distribution of Population (2011)		
		Total Population	Density	Sex Ratio	Total Population	Density	Sex Ratio
1	Shahuwadi	176856	169	912	85661	227	936
2	Panhala	238383	419	923	259417	458	915
3	Hatkanangale	709628	714	911	807751	1319	932
4	Shirol	359179	707	941	391015	777	957
5	Karvir	906866	1340	914	1037713	1561	937
6	Gaganbawada	322525	116	919	35772	129	937
7	Radhanagari	188107	209	925	199713	227	935
8	Kagal	248237	453	941	275372	505	948
9	Bhudargadh	144910	225	980	150368	237	983
10	Ajara	1211430	201	1036	120265	221	1095
11	Gadhinglaj	216257	449	1021	225734	478	1039
12	Chandgad	180781	190	1004	187220	196	1019

An examination of rural urban distribution of population reveals that 2,645,992 persons constituting 68.27 percent of the total population are concentrated in rural area, while 1,230,009 persons fanning 31.73 percent are living in urban areas of the district.

### Growth of Population:

Table gives the population of District from 2001-2011 Based on two decadal census. The year 1921 is called the years of the "Bid Divided" because during the 30 years prior to it between 1891 and 1921. India's population increased by 12.2 million or at an average rate of 0.4 million per year. The rapid increase in population after 1921 is not due to any spurt in the birth rate but due to a decline in the death rate.

There was change of 10.01 percent in the population compared to population as per 2001. In the previous census of India 2001. Kolhapur district recorded increase of 17.85 percent to its population compared to 1991.

### Density of Population :

The population density for the tahsils of Kolhapur district more or less are evenly distributed. The topography of the district has significant effect on the population density distribution. In 2001 Census, the population density for the district varies from 458 persons per sq. km in Kolhapur district. Karveer tahsil highest density 1340 in Kolhapur district and the lowest population density in shahuwadi tahsil 169 respectively.

Table No. 1 reveals that the population of the Kolhapur district is 3,876,001 (Rural 2,645,992 and urban 1,230,009) which spread over the 7685 sq. km. area. The Density of population is 504 persons sq.km. in 2011 and the tahsil level density of population is uneven. The analysis of population density shows the lowest density show western part of Kolhapur district.

Hatkanangle(1319), Karveer(1056), Shirol(777) and Kagal(505) tahsils having high density in comparison to other tahsils, it is due to well fertile soil, and good irrigation facility and urbanization and industrial development. The high density is mainly due to high agricultural base characteristics by high production efficiency agro-industry development.

### Sex Ratio:

Sex ratio useful indicator to understand woman's health and position in any society. The sex ratio of Kolhapur district is increased. It is observed that the average sex ratio in the study area was

949 in 2001. which has increased to 957 in 2011 it is ranges from a maximum of 1095 in Ajra tahsil and minimum of Hatkanangle tahsil 932 in 2011.

In the rural areas sex Ratio is 962 and for urban areas the sex Ratio is 947 in rural are 4 tahashils namely Ajra, shahuwadi, chandgad, Gandhigraj have higher sex Ratios than the district rural average tahsil Ajra and Gandhigraj have sex Ratio at par with the district rural average.

**Literacy Rate :**

As per the 2011 census, the average literacy of the district was observed is about 77.82 percent the maximum literacy rate is 86.50 per cent in Karvir Tahsil and minimum is 69.66 per cent in Gaganbawada tahsil. The maximum male literacy rate is 91.51 per cent in Karvir Tahsil and minimum was of 80.50 per cent in Gaganbawada tahsil. A low (below 70%) literacy rate is depicted in Gaganbawada, In this way female literacy rate is 81.50 in Karvir tahsil that is maximum literacy and minimum male literacy rate is 58.83 in Gaganbawada tahsil In literacy rate maximum average is getting from male group. When compare of both male and female literacy rate in Kolhapur district shows maximum literacy group has involved in male population (86.31%). This chart shows maximum literacy rate is in female population as compared male population. The average gender gap was 17.09 per cent and the maximum gender gap was found in Radhanagari tahsil (22.58%), then fallows Gaganbawada (21.67%), Bhudargad (20.27%), Chandgad (19.10%), Ajara (18.39%) and Shahuwadi (18.31).

**Table No. 2**  
**Percentage of Literacy Rate in Kolhapur District**

Sr.No	Name of Tahsil	Literacy Rate (2001)				Literacy Rate (2011)			
		Total	Male	Female	Gender Gap in Literacy Rate	Total	Male	Female	Gender Gap in Literacy Rate
1	Shahuwadi	67.64	81.08	53.83	27.25	72.83	81.99	63.68	18.31
2	Panhala	73.78	86.21	61.36	24.85	78.94	87.15	70.73	16.42
3	Hatkanangale	79.89	89.12	70.66	18.46	84.19	89.97	78.41	11.56
4	Shirol	79.96	89.33	70.59	18.74	83.33	89.84	76.83	13.01
5	Karvir	82.87	91.04	74.71	17.33	86.50	91.51	81.50	10.01
6	Gaganbawada	60.65	75.29	46.01	29.28	69.66	80.50	58.83	21.67
7	Radhanagari	71.03	85.40	56.67	28.73	77.29	88.58	66.00	22.58
8	Kagal	63.39	65.70	61.08	04.62	78.48	87.01	69.96	17.05
9	Bhudargadh	73.01	86.14	59.89	26.25	77.70	87.84	67.57	20.27
10	Ajara	70.06	82.68	57.45	25.23	74.42	83.62	65.23	18.39
11	Gadhinglaj	72.01	83.96	60.07	23.89	76.54	85.20	68.49	16.71
12	Chandgad	67.01	80.74	53.29	27.45	73.07	82.62	63.52	19.10
	<b>Average</b>	<b>71.77</b>	<b>83.05</b>	<b>60.46</b>	<b>22.67</b>	<b>77.82</b>	<b>86.31</b>	<b>69.22</b>	<b>17.09</b>
	<b>District</b>	<b>76.93</b>	<b>87.47</b>	<b>66.02</b>	<b>21.45</b>	<b>81.51</b>	<b>88.57</b>	<b>74.22</b>	<b>14.35</b>
	<b>State</b>	<b>78.88</b>	<b>87.67</b>	<b>69.31</b>	<b>18.36</b>	<b>82.34</b>	<b>88.38</b>	<b>75.87</b>	<b>12.51</b>

*Source: Review of Socio- economic survey,(2001&2011).*

**Conclusion:-**

Kolhapur District is the South West district of Maharashtra State. The total population of kolhapur district is increased in 2001-2011. It is found that growth rate was 10.01 percent during 2001-2011. It is further found that the average sex Ratio in the study areas was 949 in 2001. Which has increased to 957 in 2011. It is observed that literacy rate in study are is 76.93 percent in 2001. Which increased to 81.51 percent in 2011. The male literacy was higher than female literacy in study area.

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## Role Of Dairy Farming In Rural Economy – With Special Reference To Karnataka State

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### Abstract

*Karnataka State has always remained in the forefront of all Agricultural development initiatives in the country and dairy development are not an exception. Karnataka stands sixth in milk production in the country and it occupies third position with respect to milk production under cooperative sector in the country. The milk production was around 45.98, 47.84 and 45.39 lakh tones in 2000-01, 2001-02 & 2002-03 respectively. The per capita availability of milk is 228 grams per day<sup>1</sup>, (Ref: - Karnataka Milk Federations Annual Report – 2002-03 Page. 06) which is slightly above the national average. The per capita consumption ranges from 70 gms per day to around 250 gms per day. The lowest per capita consumption in the state is found in Kolar while the highest is in Raichur and Koppal districts.*

*Karnataka State extends over an area of 1.92 lakh sq.kms; it occupies about 5.84 % of the total geographical area of the country. The State is situated in the West-Central part of the Deccan Peninsula of the Indian Union and is stretched between 13<sup>o</sup>,3<sup>1</sup> and 18<sup>o</sup>, 45<sup>1</sup> north latitudes and 74<sup>o</sup>, 12<sup>1</sup> and 78<sup>o</sup>,40<sup>1</sup> east longitudes. The major portion of Karnataka lies in the elevation range between 450 and 900 metres above MSL. With a population of 6.11 crore, it accounts 5.05% (2011 census) of the country's population.*

**Keywords:** - Dairy Farming, per capita, consumption, Deccan Peninsula,

### I. Introduction: -

Karnataka State has always remained in the forefront of all Agricultural development initiatives in the country and dairy development are not an exception. Karnataka stands sixth in milk production in the country and it occupies third position with respect to milk production under cooperative sector in the country. The milk production was around 45.98, 47.84 and 45.39 lakh tones in 2000-01, 2001-02 & 2002-03 respectively. The per capita availability of milk is 228 grams per day<sup>1</sup>, (Ref: - Karnataka Milk Federations Annual Report – 2002-03 Page. 06) which is slightly above the national average. The per capita consumption ranges from 70 gms per day to around 250 gms per day. The lowest per capita consumption in the state is found in Kolar while the highest is in Raichur and Koppal districts.

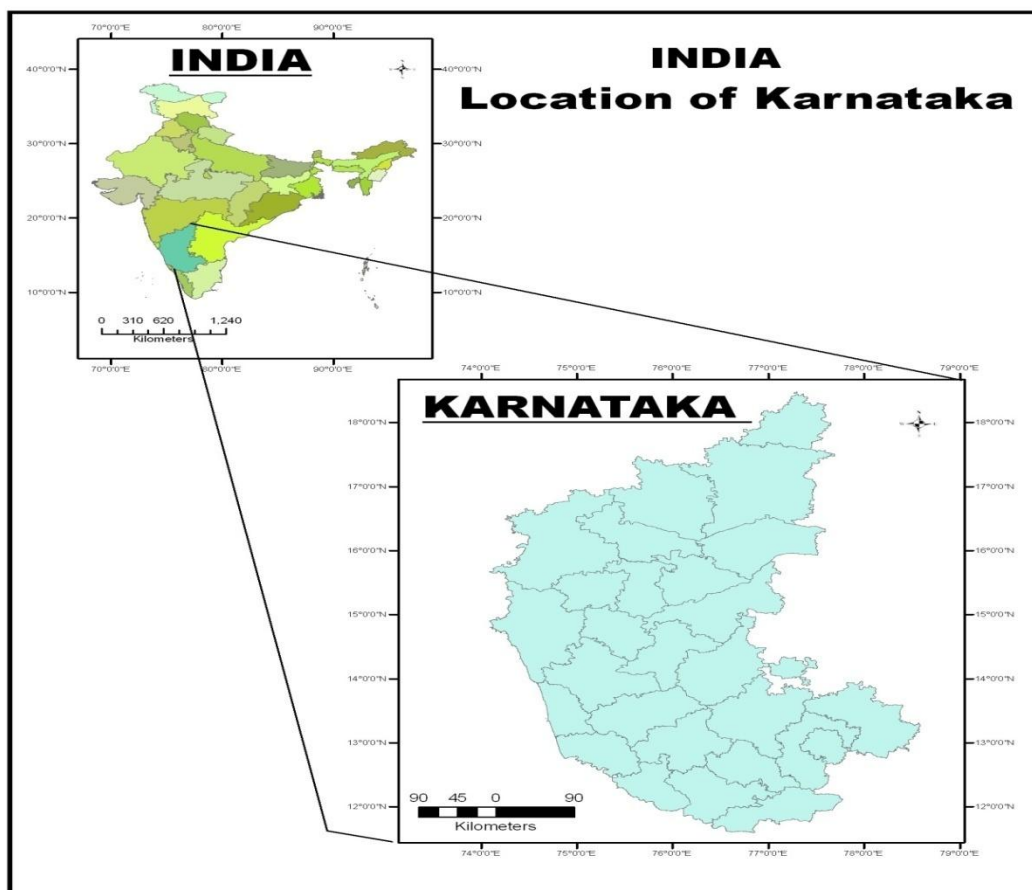
Karnataka's Dairy industry is one of the most successful initiatives undertaken to increase in rural farmer's income in the recent years. The state has developed a vast infrastructure on the basis of a cooperative network for not only procurement, processing and marketing of milk but also for promoting dairy farming and veterinary services. The daily procurement of milk in the state is over 3 million litres which results in farmers getting an income of over Rs. 1000 crores per year. A very significant aspect of the state's dairy development is that it generates income for nearly 20 lakhs rural households, in which women play a very important role in the generation of income through dairy farming. Unlike crop husbandry, dairy farming generates a continuous stream of assured income throughout the year meeting the cash needs of the households. Further, as a group activity it promotes collective action and Social cohesiveness in the rural society.

### Study Area: -

The Karnataka State is the eight largest State in the Country and is located in the Deccan Plateau. According to 2011 censuses the total population of the state is 6, 11, 30,704 accounts 5.5% of the total population of the country and ranks 9<sup>th</sup> place in the country. It extends between North latitude 13<sup>o</sup> 3<sup>1</sup> to 18<sup>o</sup> 45<sup>1</sup> and East longitude 74<sup>o</sup> 12<sup>1</sup> to 78<sup>o</sup> 40<sup>1</sup>, as shown in the (fig no – 01), the length of the State from north to south 750Kms and width from east to west 400Kms. The total Geographical area of the State is 1, 90,498sq.km accounting for 5.8% of the total area of the Country. The general elevation in the state varies between 450 to 900 mts. above mean sea level. The climate of Karnataka State varies from humid rainy monsoonal climate in the West Coast, the Ghats and malnad areas to semiarid warm dry climate on the east. There is a large variation in the rainfall with higher amounts in the Western Ghats and reducing towards the eastern plains. Along the coastal Dakshina Kannada District, the normal rainfall is about 4000mm and in the drought prone district of Bijapur, Raichur, Bellary, etc., the rainfall is of the order of 500mm to 600mm.



**Fig No: - 01**



**Objectives:** Following are the main objectives of this paper

- To know the Trend of milk Production in the state
- To know the district wise milk production variation
- To find out the demand for milk in the state.

**Data Base And Methodology:** - The present study is based on Secondary data collected from Economic Survey of Karnataka 2015-16, Karnataka At a Glance 2014-15, Karnataka milk federation annual report Data has been analyzed with the help of statistical diagrams.

**Trend Of Milk Production In The State:** - The Karnataka State is the second largest producer of milk in the cooperative sector after Gujarat in India and the daily procurement by the Karnataka Milk Federation is about 46 lakh litres. The federation has set an ambitious target to reach 65 lakh litres a day by 2015 and 1.07 crore litres by 2020.

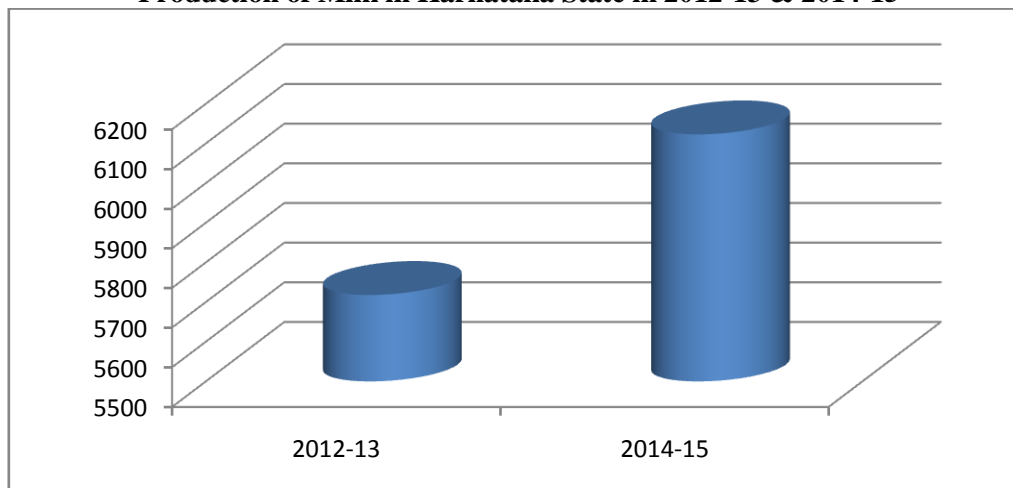
It is estimated that the total daily milk production, including that in the cooperative sector, is around 1.2 crore litres a day, and further investments in the sector could boost milk production in Karnataka.

In 2012-13 the state has produced 5718 thousand tones of milk and in 2014-15 production of milk in the state has increased to 6123 thousand tones (see table no; - 01 & graph no: - 01)

**Table No: - 01**  
**Production of Milk in Karnataka State in 2012-13 & 2014-15**

Karnatak State	Production of Milk ( In Thousand Tonnes)	
	2012-13	2014-15
Total	5718	6123

**Graph No: - 01**  
**Production of Milk in Karnataka State in 2012-13 & 2014-15**



**District Wise Milk Production:**

In view of milk production of the state, Belgaum ranks first place in 2012-13 and 2014-15. It produced 641(11.2%) tones of milk in 2013-14 and 647(10.6 %) thousand tones in 2014-15. It is because Belgaum is one the well irrigated district in the state and the farmers of the district had given more importance for dairy farming also and this district is also called as Punjab of Karnataka State. (Five rivers are flowing). Thumkur(6 & 6.2 % ) , Hassan ( 5.5 & 6.2 % ) and Manday (5 % in 2012-13 & 2014-15) districts are occupied 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> position in 2012-13 and 2014-15. Milk production ranges between 290 to 381 thousand tones in 2014-15. Tumkur district has comes under dry area in the state, hence the farmers are inevitably depend on dairy farming for their life. Manday has well irrigated district in the state, hence the farmers are adopt the dairy farming as an additional economic activity. Kodagu has occupied the last place in view of milk production in the state. It has produced 50 (0.8%) and 47 (0.7%) thousand tones of milk in 2012-13 and 2014-15. Because Kodagu is a hilly district and plantation is the main agricultural activity of the district.(see table no;- 02 & graph no:- 02).

**Table No:- 02**  
**District wise Production of Milk in Thousand Tonnes**

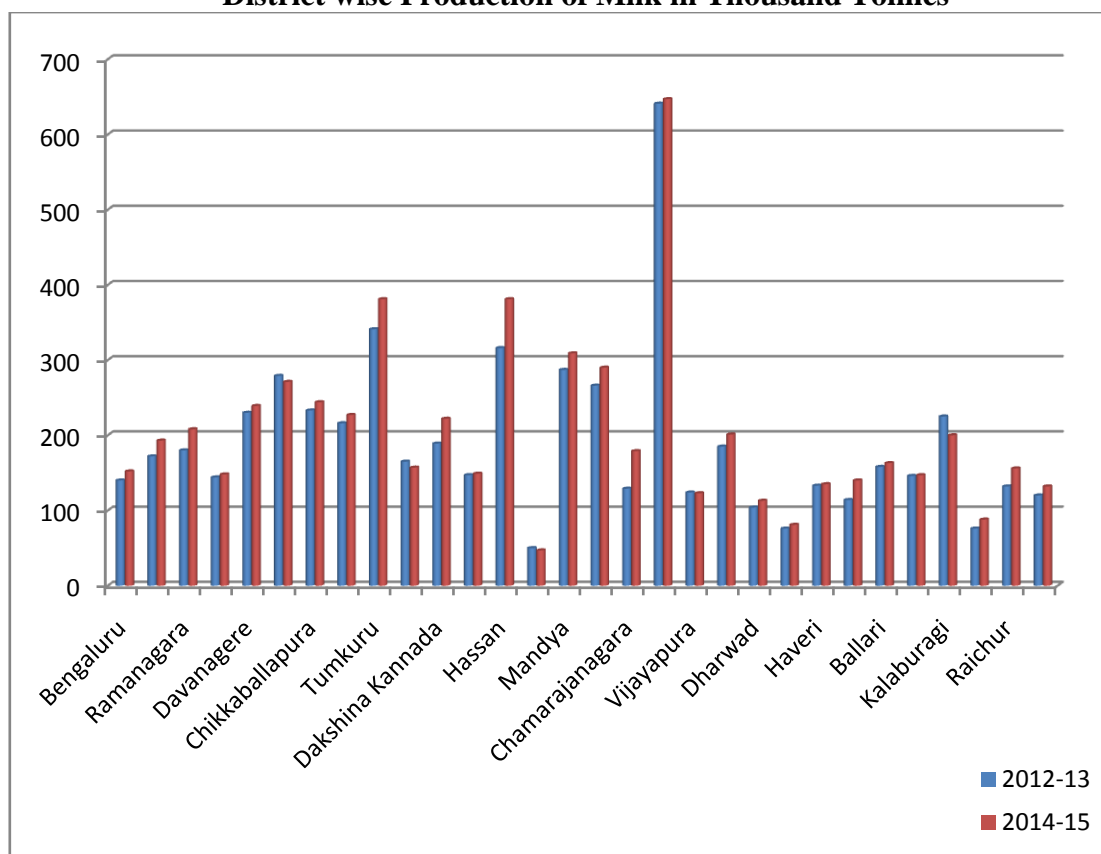
Sl.No	Districts	Production of Milk ( In Thousand Tonnes)			
		2012-13	%	2014-15	%
1	Bengaluru	140	2.45	152	2.48
2	Bengaluru(Rural)	172	3.01	193	3.15
3	Ramanagara	180	3.15	208	3.40
4	Chitradurga	144	2.52	148	2.42
5	Davanagere	230	4.02	239	3.90
6	Kolar	279	4.88	271	4.43
7	Chikkaballapura	233	4.07	244	3.98
8	Shivamogga	216	3.78	227	3.71
9	Tumkuru	341	5.96	381	6.22
10	Chikkamagaluru	165	2.89	157	2.56
11	Dakshina Kannada	189	3.31	222	3.63
12	Udupi	147	2.57	149	2.43
13	Hassan	316	5.53	381	6.22
14	Kodagu	50	0.87	47	0.77
15	Mandya	287	5.02	309	5.05

16	Mysuru	266	4.65	290	4.74
17	Chamarajanagara	129	2.26	179	2.92
18	Belagavi	641	11.21	647	10.57
19	Vijayapura	124	2.17	123	2.01
20	Bagalkot	185	3.24	201	3.28
21	Dharwad	104	1.82	113	1.85
22	Gadag	76	1.33	81	1.32
23	Haveri	133	2.33	135	2.20
24	Uttara Kannada	114	1.99	140	2.29
25	Ballari	158	2.76	163	2.66
26	Bidar	146	2.55	147	2.40
27	Kalaburagi	225	3.93	200	3.27
28	Yadgir	76	1.33	88	1.44
29	Raichur	132	2.31	156	2.55
30	Koppal	120	2.10	132	2.16
	Total	5718	100	6123	100

Source: - Karnataka At A Glance 2012-13 & 2014-15

Graph No: - 02

**District wise Production of Milk in Thousand Tonnes**



**Demand For Milk In The State:-** Keeping in view the changes in the milk supply due to modernization, the demand of the future was estimated using the population growth rate, income elasticity of demand, per – capita consumption as well as the projected population till the year 2020. The demand projections were done in order to analyze the need for modernization. As on now, the State is surplus in milk production. However, with the increase in population, our surplus is likely to

get wiped off by 2015. While projecting the demand the changes in the consumer's taste and preferences is considered constant. However, the studies show that the dairy products are increasing their share in the total diet. The demand estimates of the milk in Karnataka are presented in table no: - 03.

**Table No :- 03**  
**Demands Estimates of Milk In Karnataka ( in Lakh Tones)**

Milk Zones	Present			After Modernization		
	Current	Future	Current	2010	2015	2020
Bengalore	5.12	6.12	6.45	9.7	12.28	15.17
Kolar	3.72	5.11	1.44	2.58	4.03	6.21
Mysore	2.54	3.15	2.19	3.01	3.84	4.88
Mandya	1.53	3.86	1	1.3	1.59	1.93
Tumkur	2.67	4.26	1.98	2.83	3.89	5.29
Hassan	3.13	4.87	2.62	3.88	5.15	6.83
Dharwad	4.64	6.48	2.86	3.52	4.18	4.91
Belgaum	5.18	6.85	4.88	6.93	9.07	11.69
Bijapur	2.59	4.65	1.69	2.3	2.9	3.61
Gulbarga	2.99	4.65	2.69	3.52	4.51	5.67
Dhakshina Kannada	1.76	2.98	1.44	2	2.52	3.13
Shimogga	5.03	6.04	3.79	4.71	5.84	7.19
Raichur	6.02	7.21	7.48	9.56	11.75	14.24
Total	46.89	66.23	40.5	55.87	71.54	90.75

**Source:** Project Report - Capital requirement for modernizing of Dairy Farming in Karnataka its economic implications and prospects for Globalization. Department of Dairy Economic and Business Management Dairy Science College, UAS Bangalore – 2003. P. 170

The likely demand for milk and milk products together is to tune of 44.5 lakh tones. (Table No. 03). The current demand is around 40 lakh tones and we are in surplus. However, the Bangalore and the Raichur zones are facing shortage of milk vis-avis the demand. The other zones are in a surplus position. The Dharwad and Shimoga milk zone has more milk surplus. The Belgaum zone, which is also one of the leading producers next to Raichur, has the lowest surplus. The zones of Bangalore, Raichur and Belgaum are likely to face storage of milk.

#### **Conclusion:-**

Karnataka State is one of the important milk producing state in India. It ranks 2<sup>nd</sup> place next to Gujarat. The Dairy farming is directly influencing on the economic status of rural farmers. With the adoption of Dairy farming as an additional income source, the economic status of rural farmers has increased. In Karnataka, the role of rural women's is more in dairy development. Karnataka Government has given more importance for dairy development in the state, with giving some incentives like subsidies etc.,

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**Socio - Economicstatus Of Jain Pilgrimage Centre Kundal In Sangli District Of Maharashtra****Dr.KiranH. Majalekar**

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**Dr. Meena B. Potdar**

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**Abstract-**

*India is a country of all religions. So all pilgrimage people are celebrating their pilgrimage ceremony and processes in India therefore all pilgrimage people has established their special pilgrimage centre in India for e.g. Ajmer for Muslim, Dakshin kasha and Uttar Kashi for Hindu, Bihar Bodhgaya for Buddhist Jharkhand Madhuban for Jain. Just like this in Maharashtra also number of destinations are became cultural hub for specific religion such as haji ali for Muslim, Nashik Tryambakeshwar, Bhimashankar, Malaxmi and Tulajapur for Hindu and Mangitungi, Kunthalgiri, Bahubali, Kundal for Jain. Therefore in India and Maharashtra pilgrimage tourism is dominant from ancient period. Therefore here attempt has been made to assess Jain Pilgrimage tourism in Maharashtra. Maharashtra state has great potentiality for the Jain pilgrimage tourism. In which Mangitungi, Kunthalgiri, Bahubali, Kundal important for the Jain religion. All these destinations are established on unique geographical features. Few are established therefore facilities are available for at few destinations facilities are not available. In these destination Kundal is the destination which is having more faith in Jain religion but not established facilities are not available there here Kundal is assessed for Jain pilgrimage tourism.*

**Key Words:** Pilgrimage, tourism, geographical, tourist.

**Introduction:**

India is a country of all religions. So all pilgrimage people are celebrating their pilgrimage ceremony and processes in India therefore all pilgrimage people has established their special pilgrimage centre in India for e.g. Ajmer for Muslim, DakshinKashi and Uttar Kashi for Hindu, Bihar Bodhgaya for Buddhist Jharkhand Madhuban for Jain. Just like this in Maharashtra also number of destinations are became cultural hub for specific religion such as haji ali for muslim, Nashik Tryambakeshwar, Bhimashankar, Malaxmi and Tulajapur for Hindu and Mangitungi, Kunthalgiri, Bahubali, Kundal for Jain. Therefore in India and Maharashtra pilgrimage tourism is dominant from ancient period. In which Jain pilgrimage temple also plays important role therefore here assessment of Kundal has been made.

**Study Region:**

Kundal is a Village in Palus Taluka in Sangli District of Maharashtra State, India. It belongs to Paschim Maharashtra region. It belongs to Pune Division. It is located 39 KM towards North from District headquarters Sangli. 9 KM from Palus. 313 KM from State capital Mumbai.

**Historical Background:**

Shri Kalikund Parshwanath Digambar Jain Kshetra located in Kundal in Sangali District. Kalikund Parshwanath Digambar Jain Kshetra is surrounded by scenic beauty which also attract to the people. It is a Siddha Kshetra. The temple is devoted to Lord Parshwanath, the twenty-third Tirthankar of the Jain religion. Kundal is more than 1600 years old. It is believed that the Samavsharan of Lord Parshwanath and Lord Mahavir came here. As per legend the last Shrutkevali, Poojya Shridhara Muni attained Moksha here thus getting rid of the cycle of life.

Kundal has three temples all of Lord Parshwanath. One is Kalikund Parshwanath, second is Shri Jhari Parshwanath and third is Shri Giri Parshwanath. The Kalikund Parshwanath Temple is the main temple here; this is ancient temple with principal deity Lord Parshwanath, miraculous idol of Sand with hard & sturdy coating Black in color, 5 feet 4 inch high. Jhari Parshwanath this situated in a cave on a hill, 2 km a head of village. This idol of Parshwanath this called Jhari Parshwanath because water flows near the feet of idol throughout the year; water comes from a pond which is in the right of idol. Near this a beautiful four armed idol of Goddess Padmavati is installed. The third temple located here is dedicated to Shri Giri Parshwanath. It is positioned on a plateau known as Tapobhumi. This plateau is almost 4 to 5 km ahead from village. The idol of Parshwanath is 1 metre in height and is surmounted by seven serpent hoods. It is seated in a padmasana posture.

**No. Of Temples:**

There are three temples of Lord Parshwanath. One is Kalikund Parshwanath described above, second is Shri Jhari Parshwanath and third is Shri Giri Parshwanath.

**Transportation:** Road Busses are available from Sangli to Kundal. Busses & Auto Rickshaw are available from Pethnaka 20 km, Tasgaon 18 km and from Karad 30 km. Kirloskarvadi 3 km Railway Station on Pune Miraj Railway Line.



**Accommodation:**

For pilgrims Sansthans Dharmashal is available in that Normal Rooms 2, Attached Rooms 8; Hall 01, guest house at Kirloskarwadi, and about 100 pilgrims can stay at Kundal.

**Food:** There is no food facility available for tourist. For only at every New Moon day the food facility available for every tourist with free of cost.

**Annual Gatherings** Annual Festival at every year on the last Monday of Shravan Month.

**Nearby Places:** Some religious and tourism places are available those are, Ganapati Temple, Sangli Fort, Bahubali, Kunthugiri, and Sangmeshwar Temple etc.

**Objective:**

- 1) To study the religious basis for the development of religious tourism at Kundal.
- 2) To study the infrastructural development at Kundal for tourism development.
- 3) To study the socio-economic status of the tourist coming to Kundal.

**Methodology:**

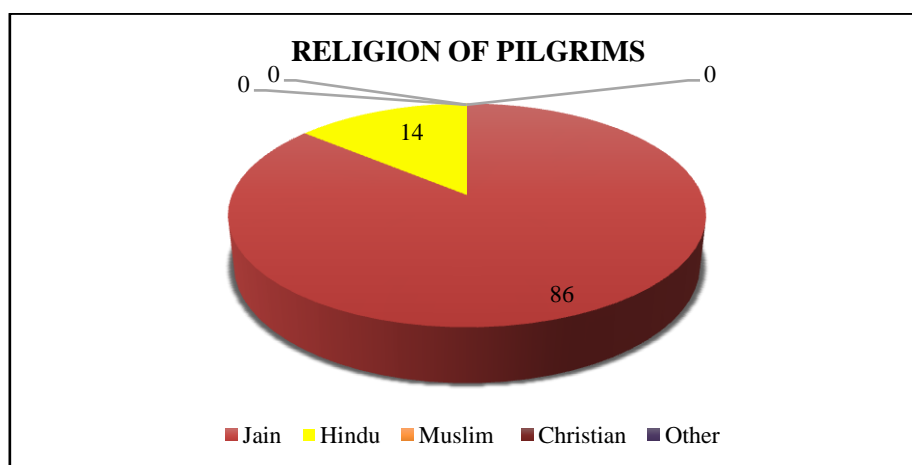
The present research paper is based on primary and secondary data. The primary data collected through schedule, interviews, spot observation from the local people as well as pilgrims. In this field survey we have filled up 400 schedules and observed that, the status of tourism in the Kundal. The secondary data collected from Sangli Gazetteer, Journals, Books and Internet are also referred to get secondary information. The collected data analyzed with simple statistical methods and represent with suitable cartographic techniques such as pie-chart, bar-graph and also with compound bar-graph.

**Religion Wise Distribution Of Pilgrims:** Here religion wise distribution of pilgrims is classified in to 5 main parts here Jain, Hindu, Muslim, and Krishnan religion distribution given in this table

**Religion distribution of pilgrims**

Religion	No of Pilgrims	Pilgrims in %
Jain	43	86
Hindu	7	14
Muslim	0	0
Christian	0	0
Other	0	0
<b>Total</b>	<b>50</b>	<b>100</b>

Source: Field work



Source: Compiled by the researcher

Kundal is purely Jain pilgrimage center and doesn't have any other attraction here therefore here mostly Jain pilgrims are coming to visit and for pilgrimage ceremony only few other religious pilgrims are coming from nearby areas only, of Jain pilgrims.

**Occupation Structure Of Pilgrims** The occupation structure of pilgrims is shown in the following table.

**Occupation Structure wise classification of Pilgrims**

Occupation Structure	No of pilgrims	Pilgrims In %
Business	3	6
Worker	19	38
Farmer	13	26
Retired	2	4
House Wife	6	12
Studding	7	14
<b>Total</b>	<b>50</b>	<b>100</b>

Source: Field work

Above table shows occupation structure of pilgrims it divided in six categories. Most of pilgrims are belongs from working sector and farming sector. After that some pilgrims are engaged in educational sector also some pilgrims are engaged in business sector and minimum pilgrims are belonging from hose wife and retired sector.

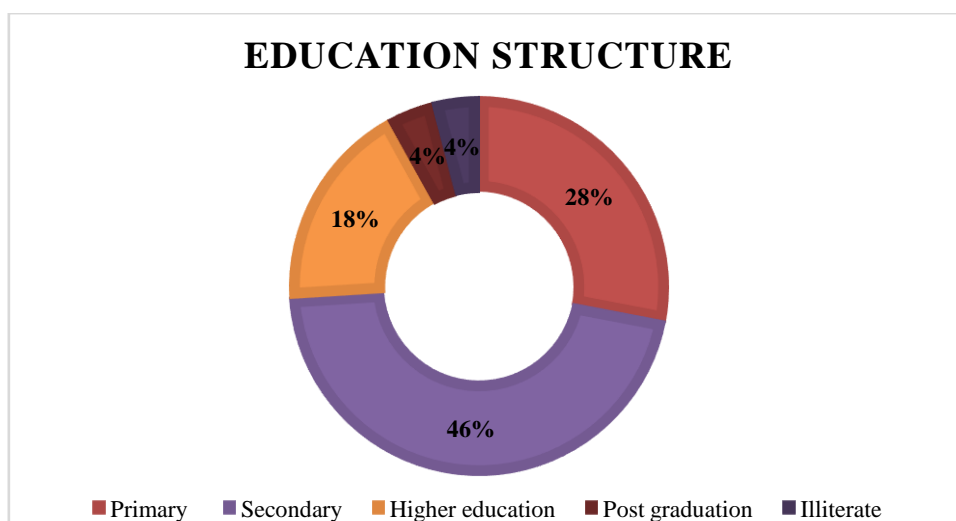
**Educational Status Of Pilgrims:**

Educational structure of pilgrims is shown it the following table also economic standard is depends on education that's why Education status of pilgrims has considered.

**Educational statuses of Pilgrims.**

Education Structure	No of pilgrims	Pilgrims In %
Primary	14	28
Secondary	23	46
Higher education	9	18
Post-graduation	2	4
Illiterate	2	4
<b>Total</b>	<b>50</b>	<b>100</b>

Source: Field work



Source: Compiled by the researcher

Above table shows Educational Structure of Pilgrims. The Educational Structure is divided in to five main categories. Because of maximum proportion of pilgrims are belonging from Jain cast and in India and Maharashtra maximum proportion of Jain population is literate so here 96% of pilgrims are literate and 4% pilgrims are Illiterate. Here most of pilgrims belongs from rural area and Senior citizens so most of pilgrims taken primary and secondary education and 22% pilgrims are take Gradational level education.

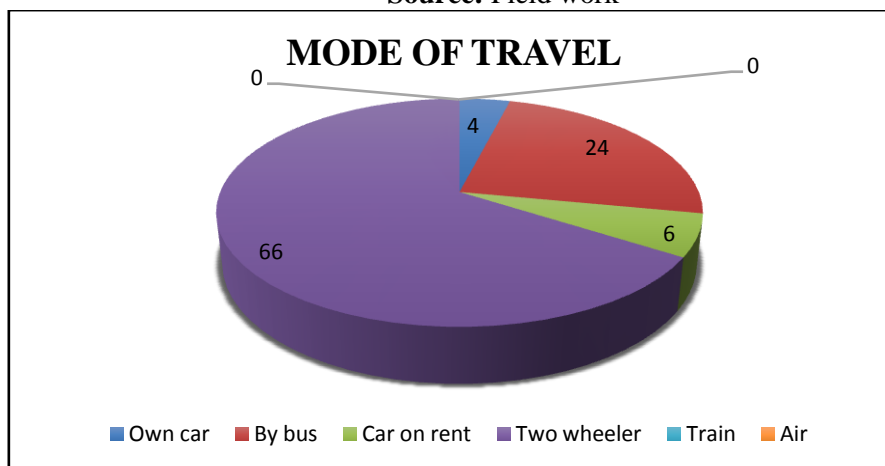
**Mode Of Travel Used By Pilgrims**

Mode of travel is depends on income of pilgrims. The Economically good person comes with car or private vehicle and medium or low Economic person come with public transport so on this regard the economic status is evaluate by using this factor.

**Mode of travel used by Pilgrims**

Mode of travel	No of pilgrims	Pilgrims In %
Own car	2	4
By bus	12	24
Car on rent	3	6
Two wheeler	33	66
Train	0	0
Air	0	0
<b>Total</b>	<b>50</b>	<b>100</b>

Source: Field work



Source: Compiled by the researcher.

Above table shows that Mode of Travel Used by Pilgrims for reach Kundal Jain pilgrimage Centre. Here most of pilgrims belongs from local area so maximum pilgrims use their two wheeler for reach the destination also the bus transportation available so some peoples use bus facility and minimum pilgrims are use own car and car on rent for reach the Kundal Jain pilgrimage center.

**Purpose Of Visit:**

Following table shows that purpose of visit by pilgrims at Kunthalgiri.

**Purpose of visit**

Purpose for visit	No of pilgrims	Pilgrims In %
Worship	45	90
Commercial	0	0
Cultural	0	0
Relatives	3	6
Enjoyment	2	4
<b>Total</b>	<b>50</b>	<b>100</b>

Source: Field work



**Source:** Compiled by the researcher.

This place is religious and mostly Jain people having much faith on this god. Therefore they are visiting this place to pray, and for different processes like Pooja, Abhishek etc. A Kundal Jain pilgrimage center is located on hill which are green so they also attract to nearby pilgrims to enjoy nature, climate and hills with their friends and relatives.

**Frequency of Visit in a Year by Pilgrims:** The frequency of visiting in a year depends upon the attractiveness and popularity of Jain pilgrimage center.

**Frequency of Visit by Pilgrims**

How many times visited	No of pilgrims	Pilgrims In %
1-3 Times	4	8
4-5Times	31	62
More than 5 Times	35	30
<b>Total</b>	<b>50</b>	<b>100</b>

**Source:** Field work

Above table shows the Frequency of Visits by Pilgrims of in a year at Kundal Jain pilgrimage centers. Here this Jain pilgrimage centers is very popular in District and Maharashtra therefore Here Most of the pilgrims are visited more than 5 times to these destinations due to they are from local surrounding areas some pilgrims are visited 4 to 5 times and those are outside from districts and minimum pilgrims are visited 1 to 3 timed due to these are from outside the districts and don't know about these destinations before visited first time.

**Infrastructural Facilities At Kundal:**

Kundal Jain Pilgrimage Center is located on hill near to Tarabad Village in Sangli district. Road Busses are available from Sangli to Kundal. Busses & Auto Rickshaw are available from Pethnaka 20 km, Tasgaon 18 km and from Karad 30 km. Kirloskarvadi 3 km Railway Station on Pune Miraj Railway Line. For pilgrims Sansthans Dharmashal is available in that Normal Rooms 2, Attached Rooms 8; Hall 01, guest house at Kirloskarwadi, and about 100 pilgrims can stay at Kundal. Therefore accommodation facilities are available here. Only few shops are there who is selling devotional goods and some other material at small stalls. Restaurants and snack stalls are not there food facility is only available at Dharmashala.

**Conclusion And Suggestions:**

Here at Kundal maximum proportion of pilgrims coming from sangli district and surrounding district and they are well educated. All pilgrims coming here are Jain very few are from other religion. Mostly they are coming for destination as deity so they do some ceremony like consecration, worship, sacrifice and to complete vow. Therefore this place is purely Jain religious destination. They are spending money on above said activities. Here pilgrims are coming from all economical range and from all age group. They prefer to spent lot of time at this place near temple

therefore they stay in Dharmashala they are mostly Jain so they eat only Jain food. Therefore here these facilities are developed very limited. But this location is on hills and having scenic beauty if it is developed for such elements then other religion tourists can come here they will enjoy destination and facilities which will become helpful in the development of the region and surrounding villages.

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## Contribution of Dairy Farming in Rural Development in India

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### **Introduction:-**

Rural development in India is one of the most important factors for growth of the Indian Economy. Indian economy is primarily an agriculture- based economy. Agriculture contributes nearly one fifth of the gross domestic product in India. The Government of India has planned several programmes to increase the growth of agriculture. The ministry of rural development in India is the apex body for formulating policies, regulations and acts pertaining to the rural development. Agriculture, handicrafts, fisheries, poultry and dairy are the primary contributors to the rural development. Dairying has been considered as one of the activities aimed at alleviating the poverty and unemployment in rural areas. Dairy farming is a major livelihood followed by many households in rural areas. This includes rearing milk cattle-cows, buffaloes, goats and sheep. Therefore it is an important source of subsidiary income to small and marginal farmers and agricultural labourers. Dairy farming is an important source of income generation to small and marginal farmers and agricultural labours. They play a very important role in milk production of the country. Small scale dairy farming in India is no doubt playing an important role in the total milk production and economy of our country. Nearly 80% of India's milk production is contributed by small and marginal farmers, with an average herd size of one to two milching animals.

Dairying has provided livelihoods to millions of the poorest in our country and for many it is the sole source of livelihood bringing cash into their hands twice a day.

Dairy enterprise is considered a "treasure" of the Indian economy, particularly for rural systems. It provides nutrition, draft animal power, organic manure, supplementary employment, cash income, and a 'cushion' for 'drought proofing' in India. The sector involves millions of resource-poor farmers, for whom animal ownership ensures critical livelihood, sustainable farming, and economic stability.

The dairy has been considered as a potential means of alleviating large scale unemployment especially in rural areas. Successful dairy enterprise not only improves the socio-economic status of rural areas but also assures them a sustained and assured means of income. Dairy farming provides an excellent opportunity for self-employment to unemployed youth. The dairy industry is one of the best opportunities to start earning in small investment. Dairy farming is a vital part of the global food system and plays important key role in sustainability of rural areas. It is one of the growing industries in India. It offers multiple opportunities to people for small scale business and leave a sustainable impact on society, economy and environment. India is the world's largest producer of dairy products by volume and has the world's largest dairy herd. India accounts for more than 15 % of world's total milk production. It is the world's largest consumer of dairy products, consuming almost % of its own milk production. Dairy products are the only acceptable source of animal protein and major source of cheap and nutritious food to millions of people in India.

### **Objectives:-**

1. To study nature of Dairy Farming in India.
2. To study the reasons of preferring dairy farming by Indian farmers.
3. To suggest remedies and actions required for future development in dairy industry.

### **Methodology:-**

The study is based on secondary data from various published sources. Data collected from these sources is compiled and analysed for the purpose of study.

### **Rural development:-**

Rural development is the process of improving the quality of life and economic well-being of people living in rural areas. It may be defined as overall development of rural areas to improve the quality of life of rural people. It is an integrated process which includes social, economic, political and spiritual development of the poorer sections of the society. Increased participation in rural development programmes, better enforcement of land reforms and greater access to credit are needed to provide better prospects to rural people for rural development.



**Dairy Farming in India:-**

A dairy is a business enterprise for the harvesting or processing of milk from cows, buffaloes, goats and sheep for human consumption. A dairy is typically located in a dedicated dairy farm or in a section of multipurpose farm that is concerned with the harvesting of milk and milk products. The major activities involved in dairy farming include collection of fodder, cultivation of fodder, grazing the animals, feeding and watering, cleaning the animals, milking and marketing of milk.

Dairy farming is the process of raising cattle from birth until the point at which they provide milk for family consumption and for distribution of revenue. Milk may be either processed on site or transported to dairy factory for processing and eventual retail sale. A dairy farmer manages milch animals and milking operations to ensure maximum milk production. Typically responsibilities include monitoring the health of cattle, administering medication, feeding, using milking equipment and managing the herds and waste. Farmers' responsibility changes according to the size and types of farming operations they manage. Smaller operations typically grow and harvest, feed their cattle and breed and raise their own cows. Larger operations tend to buy, feed and heifers.

The cooperative movement for milk was started in India in the last decade of the nineteenth century with two objectives in view—protecting the farmers from the hands of the private money lenders and improving their economic condition.

**Reasons for preferring Dairy Farming by Farmers:-**

- This activity does not require heavy capital investment as the farmers can start with the available non-descript cows or buy cows easily in local markets. The local cows are hardy and can be maintained even by landless by procuring crop residues.

- Dairy farming does not demand heavy labours and hence rural families can undertake this activity without altering their present engagement. The technology is simple and most of the local people are aware of the skills.

- There is good demand for milk and milk products even in local markets. This business provides good opportunities for women to develop this activity as an enterprise and ensure steady cash returns throughout the year. The crossbreed cows are considered as mobile cash reserves which are often sold to meet urgent cash needs. Apart from providing employment and income dairy farming has several other advantages. Livestock confuses agricultural by-product and in turn ply farmyard manure and biogas. Such mixed farming ensures nutrient recycling which is an eco-friendly practice and does not cause environmental pollution.

- Biogas reduces the dependence on wood for household fuel. The manure from animals provides a good source of organic matter for improving soil fertility and crop yields. The gobar gas from the dung is used as fuel for domestic purposes and also for running engines to draw water from wells. The surplus fodder and agricultural by-products are gainfully utilised for feeding the animals. Since agriculture is mostly seasonal, there is a possibility of finding employment throughout the year for many persons through dairy farming. Thus, dairy also provides employment throughout the year.

Problems in management of Dairy Enterprises:-

**Situational Problems:-**

This problem comprises low milk production by local breeds, shortage of green fodder, lack of clean water and shortage of milk preservation facility.

**Financial Problems:-** Financial problems include delay in milk payment followed by inadequate money and lack of loan facility, high cost of concentrate and other feeds, high cost of high yielding breeds of animals and high cost of medicines.

**Technical Problems:-** Inadequate knowledge of preventive measures of controlling the diseases, followed by non-availability of artificial insemination facilities and timely veterinary services and also non-availability of veterinary hospitals as an important problem in order to its nature and severity.

Poor knowledge about milk production and poor housing for dairy animals are the major problems of dairy development.

The majority of farmers have not knowledge about conversion of milk into value added even indigenous milk product due to that they are not getting more profit.

Cost of production of milk is high and there is lack of loan facility for dairy animals. Banks are creating problems in adopting dairy as a business.

There is non-uniform and inadequate presence of dairy cooperative societies so farmers do not get proper remuneration of their milk.

**Remedies and actions required for the future development of India's Dairy Industry:-****Production Cost Reduction:-**

In order to increase the competitiveness of Indian dairy industry, efforts should be made to reduce cost of production. This can be achieved through increasing productivity of animals, improve animal health care and breeding facilities and management of dairy. The Government and dairy industry will need to play a vital role in this direction.

**Strategy and Infrastructure Development:-** Indian dairy industry should further develop proper dairy production, processing and marketing infrastructures, which is capable of meeting international quality requirements. A comprehensive strategy for producing quality and safe dairy products should also be formulated with suitable legal backup.

**Focus on Specialty Products: -** Dairy industry in India is unique with regard to the availability of buffalo milk. In this case, India can focus on buffalo milk based speciality products such as Mozzarella cheese, in order to meet the needs of targeted consumers.

Government and milk federation must take corrective action for formation of village level cooperative societies so that farmers get proper market for milk with reasonable rate.

Dairy Development Department must conduct skill oriented long term training programme for production of value added milk production so that they get more prices for milk.

Government should take proper action for controlling the high charges taken by government veterinary doctors and staff performing medical assistance. It is necessary that government and NGO must take initiative for proper functions of AI centres.

Bank of local area should encourage the rural women for dairy business by easily availability of loans with reasonable interest. Dairy Development Department should provide subsidies to dairy farmers to promote dairy business.

Veterinary and animal husbandry officers, District Dairy Development officers and scientist must aware the farmers regarding scientific feeding practices through conducting training.

The animal husbandry Department must conduct vaccination, deworming and health care programme with the help of scientist to improve knowledge among farmers about importance of schedule of vaccination, deworming / health care of dairy animals. Also conduct training programme for better management of milch animals coupled with importance and techniques of clean milk production for milk producers.

There is need from government / other dairy development agencies to make available all essentials infrastructures along with proper supply of technical inputs and services.

United efforts of Government and NGOs are required to fight against the problems in each aspect of dairy farming practices.

**Conclusion:-**

Dairy development programmes play a vital role in the socio-economic conditions of the rural people. Higher demand for milk means adding larger number of high-breed milk producing cattle to the milch population. A large part of this cattle population is owned and reared in rural areas. Thus, small/marginal farmers and landless agricultural labourers play a very important role in milk production of the country. Dairy farming can also be taken up as a main occupation around big urban centres where the demand for milk is high. Dairy enterprise is considered a "treasure" of the Indian economy, particularly for rural systems. It provides nutrition, draft animal power, organic manure, supplementary employment, cash income, and a 'cushion' for 'drought proofing' in India. The sector involves millions of resource-poor farmers, for whom animal ownership ensures critical livelihood, sustainable farming, and economic stability. Government of India has brought agriculture and dairy farming into the peak limelight once again in Budget 2017.

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## Problems Of Farmers: Real To Reel

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Film, the technological novelty of 20th century ushered many far reaching changes in life. It is a direct product of technology, gift of the West and it brought about a revolution in the life styles all over the world. This media opened a new horizon of art, entertainment and communication.

Film media became very popular in every walks of life in India since 1920s. Lokmanya Tilak appealed Baburao Painter in 1920 to produce a film on Jaliyanwala Bagh massacre with the following words, "You produce a film on Jaliyanwala Bagh massacre, exhibit it throughout the country which would complete a task that would not be achieved by our hundred speeches and articles."<sup>1</sup> It shows a growing popularity of films in society. Beside entertainment, films are looked upon as an instrument of social awakening and social change. Impact and influence of films on society is tremendous. It is said that films are the mirror of the of the contemporary society. Real and clear picture of society can be observed on screen. To inculcate and to develop social awareness about social issues and problems, films proved helpful. Film plays an important role in enlightening the society. Some film producers took a step in this direction and handled different social issues in their films. Different contemporary issues and problems such as social evils, superstitions, denting parental control, widow marriage, divorce, economic exploitation of poor etc were handled in the movies. The researcher attempted to focus on some representative Marathi films which threw light on different burning problems of farmers.

Farming is the main occupation in India. Indian economy is based on agriculture. It is accepted fact that farmer has to face various types of severe problems. Farmer has to depend upon rain, which is unpredictable. Even after putting a hard labor the farmer cannot be sure about sufficient and timely rain. Many times he has to face famine compelling him to lend money to meet the needs of the family. This vicious circle of obtaining money from money lenders on heavy interest by mortgaging the land ultimately leads the poor farmer to be a bounded labor.

Under the banner of Maharashtra Film Company Baburao Painter threw light on this basic social problem in his first Indian realistic silent film 'Savkari Pash' (Clutches of money lenders) as early as in 1925.<sup>2</sup> It was based on N. H. Apte's story Savkari Lat, dealing with the rural money lenders harassment of poor farmers. Anyaba, a Poor farmer takes loan for his son's wedding. However, he finds it very difficult to return money with exorbitant interest. Finally he dies, his son is imprisoned. The tragedy of Anyaba opens the eyes of villagers. Kishabapu Baker's role of money lender was so effective that quite often, the audience cursed him loudly. V. Shantaram, as the son of exploited farmer and Zunzarrao Powar, as the exploited farmer, moved the audiences to tears. *Savkari Pash* turned out to be a very successful film. Shankar Bhute, in his debut performance as a Diwanji, was also very impressive.<sup>3</sup> Baburao Painter not only handked the problem of exploitation of farmers by money lenders but also underlined the importance of literacy and education. Shalini Cinetone produced a talkie *Savkari Pash* in 1937 under the direction of Baburao Painter, Chandrakant Mandare played the role of peasant's son in it. Here the reference must be made of Prabhat Film Company's *Khuni Khanjir* in 1930 was based on the story of exploitation of village folk by the headman. *Julum*, produced in 1931 under the banner of Prabhat had the similar theme. Both the films were directed by V. Shantaram.<sup>4</sup>

In this connection mention must be made of *Gabhrich Paus* (The Damned Rain), released in 2009. It again deals with the problem of unpredictable nature of rain which compels the farmer to face many sever problems such as drought, loans, inadequate yields and insufficient compensations etc. The film threw light on the sensitive issue of farmer suicides. *Gabhricha Paus* is a local dialect of Vidarbh. It is a term used to abuse the unpredictable nature of rain. The story revolves around the farmer Krisna and his struggle to grow cotton. After the debt-ridden neighbour Bhaskar Deshmukh commits suicide, amongst many other marmers of the region, Krishna's wife Alka observes Kishnas's aloofness and interprets that Kisna is contemplating suicide too. It tells about how lack of information and education amongst the farmers can ruin them, despite their indefatigable spirit. Krisna never gives up even till the end, where ill-advised, he naively tries to tap electric power from the high voltage electric power transmission lines to power his water pump of the recently installed bore-well and loses

his life by electrocution. Girish Kulkarni played the role of Kisna and Sonali Kulkarni played the role of his wife-Alka. Satish Manwar directed this film.<sup>5</sup> It is unfortunate, while describing a farmer, the image that comes to our mind is often that of a helpless debt ridden, disappointed searching for a pesticide bottle to suicide. Small and marginal farmers cannot derive any benefits from economics of scale of their small, fragmented holdings. How one can expect an average Indian farmer to become a successful entrepreneur in this atmosphere? *Pangira*, released in 2011, is a realistic truth of what is happening today in the Maharashtra State. It criticizes the corrupt system and suggests the farmers to remain united. *Pangira* is based on eminent writer Vishwas Patil's popular novel of the same name. It is the story of a village in Maharashtra plagued by water scarcity, rapidly declining rural ethos and degrading human values. Rajeev Patil directed the film whereas Sanjay Patil contributed to screenplay and dialogues.<sup>6</sup>

In this regard Marathi film makers handled different types of problems in their films. In the decade 1980s, director Rajdatta tackled very sensitive problem of bonded labor by directing the film *Shapit* (Cursed). The film is depicting exploitation of poor bounded labour by the Zamindar. Madhu Kambikar and Yashwant Dutta played the roles of bounded labour and Kuldeep Pawar played the role of zamindar.<sup>7</sup> How the illegal practice of bounded labor is still in force is shown in the film. Rajdutta, a well known film, director, directed *Are Sansar Sansar* in the same decade. This film projected the sacrifice and indefatigable spirit of Mother India.<sup>8</sup> Ranjana played the main role of Ratna in this film which was highly appreciated by the spectators and critics.

This way, Marathi film makers produced the films on severe problems of farmers and succeeded to draw attention of society towards that said issues. Marathi film producers shouldered the responsibility to make aware of these problems through film though these types of films are limited in number. Number should be increased but at least above mentioned films make the society to think sincerely towards the problems of farmers.

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## Dairy Co-operative Progress and Problems

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### Abstract

Indian agriculture plays a vital role in the economy next to agriculture dairy is the largest source of income and employment for rural people. Now India is the first rank milk producer country in the world. In 2011-12 total milk production was 127.9 million tone and per capita availability of milk is 297 gm/day. Indian dairy success is gone to Dr. Vergeshe kurien. Therefore it is called father of White Revolution and architect of operation Flood programme. Due to first phase of Operation Flood Programme (1970 to 1980 ), Operation flood – phase II ( 1981 to 1985 ), Operation flood – phase III ( 1985- 1996) the development of dairy cooperatives is such as increasing in dairy cooperatives, increasing in milk producers, increasing in liquid milk marketing and milk procurement is very satisfactory. Since 1970 total milk producing is increased. In the year of 1950-51 total milk production was 124 Million tone and per day per persons availability of milk was only 17 Gm. Since 1970, after the operation flood programme total milk production and per day per persons availability of milk is increased. It is increased 124 Mt to 127 mt in 1979-80. It is increased due to cooperative dairy development in the all states of the country. Milk production was 217 Mt in 1990 it is increased to 273 mt in 2009-10. It is increased to 307 mt of milk production and 137.7 gm per day per persons availability of milk in 2013-14. Total milk production is 355 mt and per day per persons availability of milk ia 165.4 gm. Due to this Artificial Insemination productivity of milk production is increased to 355 mt and per day per persons availability of milk ia 165.4 gm 2016-17. The trends of milk production and per day per persons availability of milk is increasing.

Dairy sector is secondary source of rural employment and income in rural area so young educted persons are engaged in dairy business. . The treads of milk production is increasing due to cross breed cow and buffalo's. NDDB is implementing various programmes to improvement of milk production and productivity of cow's and buffalos such as Production of high genetic merit (HGM) bulls through progeny testing (PT) pedigree election (PS) programme production of disease free, high quality Insemination does from high genetic improvement programme. Dairy development programme have been implemented, A.I. Programme, Fodder development, Animal health care , Clean milk. Etc. Today some problems facing by dairy industry. Such as Unhygienic Milk Supply, Problems of Transporting, Lack of Payment, Computation, High cost of Feed and Fodder, More PMCS in One Village, Adulteration, Less production quantity of milk byproducts, Political Influence, No Government subsidy for milk producers etc.

Due to difference of purchasing and selling cost, PMCS and Milk Unions and milk venders getting more profits. Farmers are not receiving profits from dairying. The result of OFP, Indian dairy co-operative sector is reached at grass rout level of poorest man and women's door stapes. Due to this rural poverty is sharply come down. This is the most important change in the several states of county. But till today some states are far away from dairy business. Compare to other regions East region is backward in dairy development. Therefore, it is need to busting for dairy activities in the economically and social back word states of India.

Key words; dairy, cooperative, operation flood, milk

### Introduction :

Indian agriculture plays a vital role in the Indian economy. 54.6 % of population is engaged in agriculture. Agriculture is unable to provide full time employment. Hence, there is need of subsidiary occupation to agriculture like Poultry, Dairying, Sheep rearing, etc. eradication of rural poverty and income inequality is one of the principle objectives of agricultural development policy in our country. Subsidiary occupation is to be adopted to tackle the problem of poverty and inequality. Next to Agriculture, Dairying is the largest source of income and employment for rural people.

India attained the status of world leader in milk production. India ranks first among the world's milk producing nations. In 1951 milk production was 17 million tonne, it is increased about 127.9 million tone in 2011-12. It is increased to 165.4 million tone in 2016-17.as compared to 155.50 million tonnes during 2015-16 its growth rate of 6.4 % . The per capita availability of milk is **291** gm/day in 2011-12. It is increased to 355 Gm per day per persons in 2016. The per capita availability of milk world average was 302 grams per day in 2016.

Most of the milk produced by small, marginal farmers and landless labours. In the co-operative sector “ ANAND PATTERN” is very successful pattern in India. Dr. *Vergese Kurien* is the father of “White Revolution” and architect of “Operation Flood Programme”. The dairy co-operative sector is very large. 198 dairy cooperative milk unions are working in the country and covered nearly

1,77,314 villages level dairy cooperatives in march 2017. The cooperative milk unions have procured an average of 428.40 lakh Kg per day of milk and sale of liquid milk 330.8 lakh liters per day during the year 2016-17. The member of Dairy Co-operative were 16.30 million farmers. Among them 48 % are women's. About 22.45 million people works in livestock sector, which around 5.8 % of the total work force in the country. Share of agricultural in GDP was 17.5 % among them livestock share was 4.5 % in 2015-16. This paper is focus on the following objective.

### 1.1) Objectives of the paper :

1. To study the dairy development in India.
2. To study the problems of co-operative dairy in india.

**1.2 ) Research Methodology :** This paper is depends upon only secondary data. Secondary Data is collected and referred from Animal husbandry reports, N.D.D.B. Reports, some Reference Books, Journals and Periodicals and various Web Sites related to Dairy.

**Dairy Development in India Since Independence :** The foundation for dairy development in India was laid in last five decades after independence. No specific provision was made in the core of the first five year plan for dairy industry development. But a fairly comprehensive programme for increased milk production was initiated in many stages. The national Dairy research institute was shifted to *karnal (Haryana)* in 1955. During the first five year plan, 27 schemes for dairy development and milk supply to town were taken up at a Total cost of Rs. 70.1 million and out of 60 million was provided for establishment of *Aarey Milk Colony* in Bombay. Aarey milk colony sold milk in the glass bottled without processing. It was supplied door- to-door directly to the consumers. Private dairy started namely "Polsons Ltd" at Anand and Edward Keventers at Aligar for meeting the limited demand of western type of dairy products like butter, cheese etc. The first large scale milk factory was started in 1954 at *Anand* by *Amul* with assistance of U.N.C.E.F. for production of milk powder ,Butter etc. on the co-operative base.

**Dairy Development During the Operation Flood Programme In India :** *Operation Flood* programme was a rural development programme started by India's National Dairy Development Board (NDDB) in 1970. It has been instrumental in helping the farmers mould their own development. Thus helping to reach milk to consumer in 700 towns and cities through national milk grid. It also helped to eradicate the need for middle man . Operation flood programme was developed to meet the requirements of liquid milk in the metropolitan cities of Bombay, Calcutta, Delhi and Madras . Although the dairy developed on modern and co-operative line of "Anand pattern" obtained all India and international recognition, it did not capture the attention of farmers at all Indian level until the operation flood programme started in 1970. The operation flood started by the inspiration of Dr. *Virgis Kurien*. A total of 126 kt. of skimmed milk powder and 42 kt. of butter oil at an international value of Rs. 419 million was imported as a gift under the world flood programme for recombination and sale as recombined milk worth Rs. 954 million. The money was ploughed back for the development of all factor of dairying in 10 state and union located around the four major cities such as Delhi, Bombay, Madras and Calcutta.

### 1) Operation flood – phase I (1970-1980)

During the first phase, the project aimed at linking India's 18 best milk shed with the milk markets of the four metropolitan cities of Delhi, Bombay, Calcutta, and Madras.

#### The objectives of the Operation Flood- phase I

1. To Increase the capacity of the city milk plant and establishing new plant.
2. Stabilize supply of milk to consumers at all time.
3. To develop a basic transportation and storage network to facilitate regional and seasonal balancing of milk supply and demand.
4. To organizing milk procurement system based on co-operative.
5. Raising standard of dairy farming by improved programme of feeding and management, animal breeding, veterinary service, feed supply.

Though 18 percent co-operative union are formed under the operation flood programme, they included 1,80,422 village dairy co-operative with their 2.6 million members and total milk procurement of 2.78 million liters per day. According to the N.D.D.B. animal health centers extended



over 11,800 villages through 172 regular mobile veterinary units. In the 1985-86, 3.4 million milk producers throughout the country have adopted “Anand pattern”

## 2) Operation flood – phase II ( 1981 to 1985 )

The second phase of operation flood implemented during July 1,1981 to July 30, 1985, arose this to some 136 milk sheds linked to over 290 urban markets. The sale capital of EEC gift projects and world bank loan has created, by the end of 1985, a self sustaining system of 43,000 villages co-operative dairy covering 4.25 million milk producers. In these phases milk powder production went up from 22,000 tons in per project years to 1,40,000 tones in 1989. The operation flood largely succeeded in building up the essential infrastructure for nationwide dairy development. Due to *Anand pattern* employment generation and per capita income has increased. Co-operative dairy in 150 district of the country to over 10 million rural milk producers. During Operation Flood II phase 11.2 million liters per day processing and 200 tones per day dairying capacity, along with matching fat handling capacity would be required. Facilities for processing fluid milk by Ultra high temperature (UHT), aseptic packing system for long life will be built to enable the modern dairy plant to cover distant market. About 42692 villages milk producers, co-operative societies covering almost 4489 thousand milk producers will contribute mainly the country has also launched a technology mission for dairy development through improved breeding, health care and fodder development programme.

### The broad objective of operation flood –II :-

1. To enable 10 million families of rural milk producers spread out in 155 district and to build a viable self sustaining dairy industry by mid 1985.
2. To enable to milk produce to rear national milch herd of about 15 million cross breed cow and upgraded buffaloes.
3. To establish a national milch grid which links the rural milk shed to the major demand centers with an urban population of about 150.
4. Infrastructure required to support available national dairy industry.
5. To enable milk and products to form an appropriate part of stable nutrition adequate national diet.

## 3) Operation flood – phase III ( 1985- 1996)

The duration of Operation flood III was five years connoting with 7th five year plan period 1985-96. The Total outlay during operation flood was of Rs. 6,812.9 million. 156 milk sheds of the country to developed strong farmers organizations enabling them to manage their milk procurement, processing, marketing and input supply function.

In the III Phase of Operation Flood's consolidated India's dairy cooperative movement, adding 30,000 new dairy co-operatives to the 42,000 existing societies organized during Phase II. Milk sheds peaked to 173 in 1988-89 with the numbers of women members and Women Dairy Cooperative Societies increasing significantly. Phase III gave increased emphasis to research and development in animal health and animal nutrition. Innovations like vaccine for *Theileriosis* , bypass protein feed and urea-molasses, mineral blocks, all contributed to the enhanced productivity of milch animals. From the outset, Operation Flood was conceived and implemented as much more than a dairy programme. Rather, dairying was seen as an instrument of development, generating employment and regular incomes for millions of rural people.

**Table No. 01. Dairy Development In India During Operation Flood - I (1970-80)**

Year	.M.C.S.	Membership (000)	Per year milk collection ( lakh tonne)
1970-71	1,588	279	1,898
1971-72	1,811	327	2,372
1972-73	2,200	361	2,774
1973-74	2,598	394	2,226
1974-75	2,966	445	3,175
1975-76	4533	562	4,197
1976-77	7,691	723	5,657
1977-78	9,306	943	6,205
1978-79	10,099	1,213	7,336
1979-80	11,436	1,475	8,614
1980-81	13,270	1,747	9,344

**Dairy Development during Operation Flood-II(1981-1982 to1984-1985)**

Year	PMCS	Membership(000)	Per year milk collection ( Lakh tonne)
1981-82	18,422	2,124	10,147
1982-83	23,496	2,620	16,133
1983-84	28,614	3,116	19,016
1984-85	34,523	3,632	21,097

**Dairy Development during Operation flood III ( 1985-86 to 1989-96 )**

Year	PMCS	Membership(000)	Per year milk collection ( Lakh tonne)
1985-86	42,692	4,484	28,762
1986-87	49,077	5,097	28,665
1987-88	54,525	5,666	28,1052
1988-89	58,883	6,220	29,090
1989-90	60,825	7,003	35,821

Source : Dudhache Antaranage, 1992, Dairy publication, Bombay

Table no. 01.shows the dairy development during the operation Flood programme I, II and III phase. Dairy development during the O.F. periods is most important factor in Indian dairy industry. Due to O.F. programme Indian dairy industry reached successfully White Revolution through co-operative sector. Dr. Verghese Kurien is the father of Operation Flood Programme. In first phase of Operation Flood Programme (1970 to 1980 ) total number of dairy primary milk co-operative societies ( PMCS) set up only 1588 with their 278 thousand milk producers and they collected milk during one year i.e. 1898 lakh tonne in 1970-71.The organization of PMCS is very strong and has spread all over the country in a short time period. In 1980-81 total number of PMCS was 13,270 working with 1,747 thousand milk producers and they collected 9,344 lakh tone milk in 1980-81.

In the second phase of O. F. ( 1981-82 to 1984-85 ) total PMCS was 18,422 in 1981-82, it is increased to 34,523 in the end of O.F. II phase ( 1984-85 ). The membership was 2,124 thousand in 1981-82, it is increased to 3,632 thousand in 1984-85, and milk collection increased 10,147 lakh tonne to 21,097 lakh tonne in 1984-85.

In the O.F. III phase ( 1985-86 to 1989-96 ) the total PMCS was 42,692 in 1985-86, it is increased to 60,825 in 1989-90, and total milk producers membership was 4,484 thousand it is increased to 7,003 thousand in 1989-90. The milk collection was 28,762 lakh tonne in 1985-86, it is increased to 35,821 lakh tonne in 1989-90. Due to Operation Flood Programme dairy industry spread all over the county. Therefore, people have increased their standard of living life style.

**Table No. 02. Milk production and per day per person availability of milk**

Year	Milk production ( in million Tonn)	per day per person availability of milk ( in Gm/Day)
1950-51	124	17.0
1960-61	124	20.0
1968-69	112	21.2
1979-80	127	30.4
1989-90	173	51.4
1999-2000	217	78.3
2009-10	273	116.4
2010-11	281	121.8
2011-12	290	127.9
2012-13	299	132.4
2013-14	307	137.7
2014-15	322	146.3
2015-16	337	155.5
2016-17	355	165.4

Ref. Annual Report- 2016-17, CH. IV, P.55 , Department of Animal Husbandry and Fisheries, Ministry of Agricultural,

Above table. 02 shows that milk production and per day per persons availability of milk. In the year of 1950-51 total milk production was 124 Million tone and per day per persons availability of milk was only 17 Gm. Since 1970, after the operation flood programme total milk production and per

day per persons availability of milk is increased. It is increased 124 Mt to 127 mt in 1979-80. It is increased due to cooperative dairy development in the all states of the country. Milk production was 217 Mt in 1990 ti is increased to 273 mt in 2009-10. Dairy sector is secondary source of rural employment and income in rural area so young educted persons are engaged in dairy business. Total milk production is increased year of year other hand per day per persons availability of milk is increased. In 2009-10 it was 116.4 mg it is increased to 211.8 gm per day. The trends of milk production is increasing due to cross breed cow and buffalo's. NDDB is implementing various programmes to improvement of milk production and productivity of cow's and buffalos. Production of high genetic merit (HGM) bulls through progeny testing (PT) pedigree election (PS) programme production of disease free, high quality semen does from high genetic improvement programme. Dairy development programme have been implemented, A.I. Programme, Fodder development, Animal health care , Clean milk. etc. Due to this Artificial Insemination productivity of milk is increased. In 2011-12 total milk production was 290 mt and per day per persons availability of milk 127.9 it is increased to 307 mt of milk production and 137.7 gm per day per persons availability of milk in 2013-14. Total milk production is 355 mt and per day per persons availability of milk ia 165.4 gm 2016-17. The trends of milk production and per day per persons availability of milk is increasing.

**Table No. 03 Development of Dairy Cooperative in India.**

Particulars	1980-81	1990-91	2000-01	2015-16	2016-17
North region Dairy cooperative Societies	2676	22126	31977	57309	61997
East region Dairy cooperative Societies	702	4364	7113	29792	30878
West region Dairy cooperative Societies	5957	18513	32543	49627	49215
South region Dairy cooperative Societies	3949	18345	24670	34334	35224
<b>Total Dairy cooperative Societies</b>	<b>13,284</b>	<b>63,415</b>	<b>96,206</b>	<b>1,71,062</b>	<b>1,77,314</b>
North region Milk Producers Members(In thousands )	163	1239	1660	2541	2782
East region Milk Producers Members(In thousands )	23	223	422	1578	1658
West region Milk Producers Members(In thousands )	852	2614	3805	5641	5670
South region Milk Producers Members(In thousands )	709	3406	4851	6076	6172
<b>Total Milk Producers Members(In thousands )</b>	<b>17,447</b>	<b>7,482</b>	<b>10,738</b>	<b>15,836</b>	<b>16,282</b>
North region Liquid Milk Marketing (In thousands liters per day)	719	1756	3048	10228	10587
East region Liquid Milk Marketing (In thousands liters per day )	308	750	1314	2916	3147
West region Liquid Milk Marketing (In thousands liters per day )	1217	3787	4800	10229	10629
South region Liquid Milk Marketing (In thousands liters per day)	539	2753	4201	8695	8718
<b>Total Liquid Milk Marketing ( Thousand liters per day)</b>	<b>2,783</b>	<b>8,046</b>	<b>13,363</b>	<b>32,128</b>	<b>33,088</b>
North Milk procurement (in Thousands Kg per day)	310	1259	2890	5009	5114
East region Milk procurement (in Thousands Kg per day)	34	200	642	2547	2398
West region Milk procurement (in Thousands Kg per day)	1577	5246	7897	22296	22637
South Region Milk procurement (in Thousands Kg per day)	641	2997	5057	12705	12696
<b>Total Milk procurement (in Thousands Kg per day)</b>	<b>2,662</b>	<b>9,702</b>	<b>16,504</b>	<b>42,557</b>	<b>42,845</b>

Ref. Annual Report- 2016-17, p 74 , Department of Animal Husbandry and Fisheries, Ministry of Agricultural

The *Amul* or *Anand* model of co-operative structure builds on a vertically integrate single industry co-operative that link rural producers with urban consumers by introducing intensive milk production systems and improvement technology for processing and marketing. It is a three tiered structure are 1.The village milk co-operative society 2.The district milk producers unions. 3.Co-operative milk marketing federation.

Above table no. 03 shows that the development of dairy cooperative in India. The growth of dairy cooperative is very faster since operation flood. North region of Indian states are Haryana, Hemachal Pradesh, J and K, Punjab, Rajasthan, U.P and Uttarakhand, In East region Assam, Bihar, Jharkhand, Meghalaya, Mizoram, Nagaland, Odisha, Sikkim, Tripura and West bengal. In West region chhattisgarh, Goa Gujarath, Mp, and Maharashtra and in South regions AP, Karnataka, Kerala, Tamil Nadu, Telanga and Puducherry. These are the regional divisions of India.

A total dairy cooperative of four regions was 13,284 in 1980-81. It is increased to 63,415 in 1990-91. In 2000-01 it is 96,206 it is increased to 1,71,062 in 2015-16 and 1,77,314 in 2016-17.

Total Milk Producers Members was 1,747 thousand in 1980-81. It is increased to 7,482 thousands in 1990-91. Due to operation flood and dairy development programme the milk producers are increased. In 2000-01 it was 7482 thousand it is increased to 103738 thousand. In 2015-16 total milk producers was 15836 thousand it is increased to 16282 thousand. These milk cooperative societies are procurement of milk from milk producers every morning and evening time in a day. In 2000-01 procurement of milk was to 2562 thousand liters per day. It is increased to 9702 thousand liters per day in 1990-91. The trend of milk procurement is increasing. In 2000-01 it was 16504 thousand liters per day. It is increased to 42557 thousand liters per day in 2015-16, it is increased to 42845 thousand liters per day.

In India about 85 % milk marketed in liquid form and only 15 % milk used for processing. Liquid Milk Marketing in 1980-81 total Liquid Milk Marketing was 2783 Thousand liters per day. It is increased to 8046 thousand liters per day. In 2000-01 it was 13363 Thousand liters per day, it is increased to 32128 Thousand liters per day) in 2015-16 and 33080 Thousand liters per day in 2017-18. Compare to other regions East region is backward in dairy development.

### Problems of Dairy Co-operatives:

**1) Unhygienic Milk Supply** Milk producers do not clean sheds and cow before milking. Especially they do not wash the udder before milking and after milking. Some time dung fall down in the milk when milking process is going on. They do not use properly washed and cleaned utensils. Farmers are not supply clean milk to the PMCS.

**2) Problems of Transporting:** Transporting is not speedy from PMCS to Sangh and the milk transporting Trucks and Tempos is open. Hence, sunlight and road dust effects on milk, so this milk is became spoiled. Due to this the growth of microorganism is high. Some time milk cans are not properly cleaned and not covered.

**3) Lack of Payment:** Milk unions do not pay payment of milk in time but always late. Therefore, PMCS are not able to pay the payment to the milk producers. Hence, milk producers have to get money from money lenders with high interest rate. Therefore, milk producers are in loss and deep in debt.

**4) Computation:** Since 1993, Govt. applied de-licensed policy in the dairy sector. Due to this policy many private milk unions are set up in throughout Maharashtra . Therefore, milk collection of MPCS and also co-operative Sangh is declines.

**5) High cost of Feed and Fodder :** The general price level of feed and fodder cost is going up day by day and milk price is constant. This is the direct impact on milk production. Therefore, cost of milk production is increasing.

**6) More PMCS in One Village:** Co-operative Milk Sangh and PMCS have adopted ANAND PATTERN, but they have not accepted **one village one dairy co-operative**. In one village three or six PMCS are working. Therefore milk procurement cost, management cost, labour cost increase. Only political view is responsible for increasing the number of dairy co-operatives day by day.

**7) Problem of Adulteration:** Milk producers are not aware about hygiene of milk. Milk producers are adding sugar, starch in the milk. Therefore, total milk gets damaged.

**8) No Proper Milk Testing:** Some time low quality of milk is accepted by PMCS. Dairy staff and milk producers have economic affair. So, milk producers mix water and other things in to the milk. Therefore, supply of milk to PMCS is very poor quality, Fat and SNF tests are very low.

**9) Milk collection :** Many PMCS are not having own sheds therefore. They collect milk on the roadside or open place. It is unhygienic. Large number of farmers supplies milk in small quantity and low quality of milk to the PMCS. The biggest challenge before the cooperative milk unions and PMCS is to improve the quality of milk at the farmer's level.



**10. Less production quantity of milk byproducts :** India having first rank in milk production in the world. But milk byproducts production is very less compared to other countries. In India only 12 % of milk is used for byproducts. Average Co-operative milk unions are used only 0.17 % to 0.26 % milk for byproducts. It is very low percentage of milk used for by products. Therefore, there is the need of more produces milk byproducts and get its value added income.

**11) Political Influence:** Co-operative milk societies are working under the pressure of local political parties. Each village has three or six PMCS, each political party have one or two PMCS. Therefore, some time cutthroat competition and political conflict arise.

**12) Milk price difference between milk procurement and consumer price ;** The price of one liter of cow milk in Mumbai area is Rs.40 and rest of Maharashtra is less one rupee for each type of milk. In Mumbai area full cream milk and buffalo milk is selling Rs. 50 per liter and toned milk is Rs. 45 per liter. The cow milk price of one liter is only Rs. 22 and same time consumer price of cow milk is Rs.40 per liter in Mumbai area. So the difference between cow milk procurement and selling to consumer is very high i.e Rs. 18.

Therefore, PMCS and Milk Unions and milk vendors are getting more profits. Farmers are not receiving profits from dairying.

**13. No Government subsidy for milk producers;** In India no any domestic or export subsidies. Our markets are full open for dairy products imported, but other developed countries like EU, New Zealand, Australia and USA gave more subsidies to their milk producers. Due to high export subsidies, export is very high i.e. EU 38 %, Australia 12 % , USA 5 % and New Zealand 31 %.

### Conclusion:

Indian agriculture plays a vital role in the economy. Next to agriculture dairy is the largest source of income and employment for rural people. Now India is the first rank milk producer country in the world. In 2011-12 total milk production was 127.9 million tone and per capita availability of milk is 297 gm/day. Indian dairy success is gone to Dr. *Vergeshe kurien*. Therefore it is called father of White Revolution and architect of operation Flood programme. Due to first phase of Operation Flood Programme (1970 to 1980 ), Operation flood – phase II ( 1981 to 1985 ), Operation flood – phase III ( 1985- 1996) the development of dairy cooperatives is such as increasing in dairy cooperatives, increasing in milk producers, increasing in liquid milk marketing and milk procurement is very satisfactory. Since 1970 total milk producing is increased. In the year of 1950-51 total milk production was 124 Million tone and per day per persons availability of milk was only 17 Gm. Since 1970, after the operation flood programme total milk production and per day per persons availability of milk is increased. It is increased 124 Mt to 127 mt in 1979-80. It is increased due to cooperative dairy development in the all states of the country. Milk production was 217 Mt in 1990 it is increased to 273 mt in 2009-10. It is increased to 307 mt of milk production and 137.7 gm per day per persons availability of milk in 2013-14. Total milk production is 355 mt and per day per persons availability of milk is 165.4 gm. Due to this Artificial Insemination productivity of milk production is increased to 355 mt and per day per persons availability of milk is 165.4 gm 2016-17. The trends of milk production and per day per persons availability of milk is increasing.

Dairy sector is secondary source of rural employment and income in rural area so young educated persons are engaged in dairy business. . The trends of milk production is increasing due to cross breed cow and buffalo's. NDDDB is implementing various programmes to improvement of milk production and productivity of cow's and buffalos such as Production of high genetic merit (HGM) bulls through progeny testing (PT) pedigree election (PS) programme production of disease free, high quality Insemination does from high genetic improvement programme. Dairy development programme have been implemented, A.I. Programme, Fodder development, Animal health care , Clean milk. Etc. Today some problems facing by dairy industry. Such as Unhygienic Milk Supply, Problems of Transporting, Lack of Payment, Computation, High cost of Feed and Fodder, More PMCS in One Village, Adulteration, Less production quantity of milk byproducts, Political Influence, No Government subsidy for milk producers etc.

Due to difference of purchasing and selling cost, PMCS and Milk Unions and milk vendors getting more profits. Farmers are not receiving profits from dairying. The result of OFP, Indian dairy co-operative sector is reached at grass root level of poorest man and women's door steps. Due to this rural poverty is sharply come down. This is the most important change in the several states of county. But till today some states are far away from dairy business. Compare to other regions East region is backward in dairy development. Therefore, it is need to busting for dairy activities in the economically and social backward states of India.



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## Application Of Gis And Remote Sensing Techniques For Water Resource Management

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### Introduction

One of the underlying principles of watershed management is the recognition of the interrelationships among land use, soil, and water, and the linkages between uplands and downstream areas. Watershed management has always required synthesizing a vast array of spatial information to assess downstream impacts. Moreover, it is important to know not only the percent of a given land use, but also its distribution in a watershed. For example, runoff and sediment from a dirt road has a greater probability of reaching a stream channel if the road is located in a flood plain rather than on a ridge top. In the past, obtaining spatial information has been time consuming and difficult. As a result, many of our watershed assessment methods are predicated on only general information regarding the spatial characteristics of our watersheds. However, even the relatively simple task of manually overlaying land use and soil maps, delineating the watershed and soil/land use boundaries, and then finding their with a planimeter could take a watershed manager days, if not weeks, to accomplish for a complex watershed. Using conventional means, the time it takes to perform such analyses at regular intervals to assess the effects of dynamic land use is prohibitive. The revolution currently occurring in the field of information technology is changing the profession of watershed management. New tools such as Global Positioning Systems (GPS) and Remote Sensing are being developed to inventory and monitor watershed characteristics. Geographic Information Systems (GIS) have the power to collect, store, analyze and display geo-referenced information. Maps have always been one of the principal tools of a watershed manager and these computerized maps are becoming one of the most important tools in watershed management. In turn, GIS are being linked to simulation models and decision support systems. This change is fueled by rapid expansion in the computer industry that is providing technology capable of delivering, storing, and analyzing vast quantities of information.

In theory, given a suite of sophisticated research tools, solving the aforementioned Curve Number of problems should now be simple and quick. Unfortunately, that is usually not the case. The spatial (GIS) data for soils and land use first must be gathered and entered into the computer, models redesigned and encoded to efficiently use the new information, and watershed managers trained to use the new technology. This investment in developing new processes is essentially an up-front cost that will diminish and pay large dividends as techniques are developed and improved. The profession of watershed management has already embarked on this process. Databases are being developed and spatial data is becoming readily available through the Internet. Models and Decision Support Systems (DSS) that can utilize the spatial information are becoming available at a rapid rate. Emerging tools and technologies hold great promise for improving the understanding of ecosystem process and revolutionizing watershed management the tool and technologies include:

- Improved remote sensing platforms
- GPS
- GIS
- The internet

Here an attempt has been made how to apply the recent Geo-technologies to extend the prospects of watershed management.

### Hypothesis

1. Water management will improve the ecosystem.
2. Water management may increase the underground water level of study area.
3. Emerging tools and technologies may induce the new ways to explicate the problems.
4. It help to formulate guidelines for the next generation of watershed management development
5. Improving the management of land and water, and their interactions and externalities.
6. Increasing the intensity and productivity of resource use in the upland area with the objective of reducing poverty and improving livelihoods.
7. The excessive use of agriculture inputs contributes in contamination of ground and surface water.

8. New tools such as Global Positioning System (GPS) and Remote sensing are being developed to inventory and monitor watershed characteristics.
9. Research tools may solve the problem of study area in simple and quick way.

### Methodology

1. Maps have always been one of the principal tools of a watershed manager these computerized maps are becoming one of the most important tools in watershed management in turns, GIS are being linked to simulation models and decision support system.
2. To pursue the research both primary and secondary data will be collected.
3. On the basis of result, present and future scenario of water management in study area will be projected more affectively.
4. Survey of some related area will be conducted to understand the problems of water management.
5. A questionnaire will be prepared and queries will be filled up with help of related people and authorities.
6. Emerging tools and technologies hold great promise for improving the scientific understanding of watershed processes and are already revolutionizing watershed research.

### Hindrances In Watershed Development Programme

There are many natural and man made situations, which affect the normal process of development .the main among them are as under:

1. Lack of awareness due to illiteracy.
2. Lack of participation and local politics.
3. Difficult geographical boundary, difficult accessibility.
4. Sensitive environment.
5. Lack of technical knowledge and suitable human capacity.
6. Lack of correct information and statistics.
7. Lack of funds

### Data Acquisition

By definition, watershed and landscape processes are spatially distributed, and a host of surface characteristics dictate hydrological responses to landscape change. Assessment and modeling techniques must therefore account for the spatial variability of important variables, including soil, vegetation, management, topographic geologic and hydrologic characteristics. Determining the precise boundary of these and other characteristics is critical, yet a daunting proposition. Mapping techniques relying on surface travel and surveying equipment are tedious, locally intensive but non-continuous, and relatively inaccurate. Advances in the spatial characterization of the earth, specifically the advent of remote sensing and global positioning systems (GPS), allow for the rapid and precise assessment and mapping of spatially distributed surface properties.

### Remote Sensing and Geographic Information Systems (GIS)

Remote Sensing means getting information regarding any place located at a distance using artificial satellites and space skills. This is an advanced technique, which gives information regarding changes occurring on the earth from time to time. Electro-Magnetic energy obtained from sun or auto-abandonment is used as a source in it. Transmission of this energy into the atmosphere is caused on the ground as a source through absorption or expansion Reflection and abandonment of electro-magnetic energy from the ground is important for getting information from the earth. They cause interaction, which transmits energy from the earth to remote sensors. The remote sensors located in satellites, collect different types of information and send it to receiving stations on the earth, which is used after digital image processing. The resolution of remote sensors is the most important fact in this technique. For example, the resolution of remote sensors LISS III of Indian Satellite IRSIC is 23.5 metre whereas the resolution of Panchromatic (pan) is 5.8 metre.

There are three types of platforms in the remote sensing technique. Platform is a rectangular position of the camera which obtains information regarding the target. According to height, they are of three types. These are:

1. Ground Borne
2. Air Borne
3. Space Borne

Ground-borne remote sensing system is used for study of land resources for which detailed information is received with the help of space technology and satellites. Airborne technique is

normally used for getting air photo picture for photo interpretation and detailed description can be obtained at any time through them. Space borne platform are generally not affected by the environment of the earth and they move independently in their orbit. Vast statistics can be obtained from them though they depend on the extension of the sphere of the satellite.

For the last 30 years, many geographers had been thinking about a system by which spatial information could be organized and stored using computer. During the last decade, this growing technique came to be known as 'Geographical Information System'. Geographical Information System is mainly a system of computer hardware and analysis and individual planning. In other words, it is an information technology which analyzes spatial and non-spatial data after its Management Technology. They include mainly computer science, cartography, information management, telecommunication, geology, photo-geometry, remote sensing etc. Geographical Information System has developed in many forms. The first publication of the word 'Geographical Information System' was made in 1965 by Michael Deacy and Deven Marbel

Of Northwest University in a paper written by them. This name is related with the following techniques:

1. Automated Mapping
2. Computer-Aided Mapping
3. Computer-Aided Design
4. Computer-Aided Drafting
5. Geographical Information System
6. Geo-processing and Network Analysis
7. Land Information System

### **Elements of Geographical Information System**

The main elements of Geographical Information System (GIS) include hardware, software, digitizers, C.D., key board, graphics, monitor, plotter and printer.

#### Computer Hardware:

The computer hardware has a hard disc for collection of data and programs. Digital tape cassette, C.D.Rom etc., are also parts. Scanner digitizer is used for converting maps and data in digital form. Plotter or printer is used for demonstrating the result.

GIS Software: Geographical Information System is divided in five function classes. They are:

1. Presentation and verification of data.
2. Storage and management of data.
3. Exit and presentation of data.
4. Transfer of data.
5. Interaction with user.

### **Utility of Geographical Information System and Remote Sensing**

Use of Geographical Information System and Remote Sensing is possible in the following areas:

1. Agricultural development
2. Land valuation analysis
3. Study of changed reflection capacity of vegetative regions
4. Analysis of deforestation and environment crisis.
5. Supervision of vegetative health.
6. Management of land degradation.
7. Estimation of area of crops and production
8. Mapping of waste lands.
9. Soil Resource Mapping.
10. Groundwater probability Mapping.
11. Discovery of geological minerals.
12. Supervision of forest fire.
13. Supervision of Oceanic products.
14. Water Resources Management etc.

Geographical Information System and Remote Sensing technique has performed an important role in water resources management since suitable and sufficient quantity of information can be obtained from satellite. The following aspects of water resources management can be studied with the help of Geographical Information System and Remote Sensing:

1. Survey and search of surface water.
2. Hydrological studies.

3. Watershed conservation, planning and management.
4. Management of flood affected areas.
5. Water management in irrigated areas
6. Groundwater management.

### Conclusions

Emerging technologies like GPS and GIS hold the promise of making research and management tasks easier and provide capabilities previously unknown. New modeling systems will allow us to ask spatial explicit questions, such as what effect will a buffer have downstream water quality. However, using the new technology does not remove the need of having clear objectives and then determine at what level the new technology will be used.

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## A Study- Scope And Opportunities Of Agro Tourism In Maharashtra

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### Abstract:

*Agritourism is a very latest concept and form of tourism in India. It gives an opportunity to experience the real enchanting and authentic contact with real life. Promotion of Agri tourism needs conceptual convergence with rural tourism, health tourism and adventure tourism. Agri-tourism in state of Maharashtra has witnessed the growth in the past years and helped additional income to the farmers. My study basically concentrates on the future scope of Agritourism in Maharashtra in relation to the challenges in development. In order to develop Agritourism as a viable option or form of tourism it is important to have an advisory service in place to make it sustainable.*

**Key words:** Agri tourism, Promotion, Farmers, Advisory services.

### Introduction

Tourism is now well recognised as an engine of growth in the various economies in global. Many countries have transformed their economies by developing their tourism potential. Tourism has great capacity to generate large-scale employment opportunities and additional income sources to the skilled, semiskilled and unskilled. Now the concept of traditional tourism has been changed. Some new areas of the tourism have been emerged like Agro-Tourism. Promotion of tourism would bring many direct and indirect benefits to the people and country. Agro-tourism is an innovative agricultural activity related to tourism and agriculture both. It as a great capacity to create additional source of income and employment opportunities to the farmers. Maharashtra is one of the major tourist centers in the India and there is large scope and great potential to develop agro-tourism.

### Research Design And Methodology

#### Selection Of Research Topic

Now a days, too much discussion is going on Agro Tourism. This paper focuses on scope and opportunities of Agro Tourism in Maharashtra.

#### Objectives Of The Study

1. To review the requirement for Agro Tourism development.
2. To identify the beneficiaries of Agro Tourism.
3. To examine the problem faced by Agro Tourism.

#### 2.3. Research Methodology

The paper is based on secondary data. The data has been collected from internet. Graph and percentile method has been used to analyze the data.

#### 2.4. Limitations Of The Study

1. The study has been conducted on secondary data.
2. The study focuses on Agro Tourism.

The dictionary meaning of Agritourism is tourism in which tourist's board at arms or in rural villages and experience farming at close hand. Barbieri and Mshenga define Agritourism as "any practice developed on a working farm with the purpose of attracting visitors." McGehee, Kim, and Jennings explain Agritourism as "rural enterprises which incorporate both a working farm environment and a commercial tourism component a specific type of rural tourism in which the hosting house must be integrated into an agricultural estate, inhabited by the proprietor, allowing visitors to take part in agricultural or complementary activities on the property. Activities of hospitality performed by agricultural entrepreneurs and their family members that must remain connected and complementary to farming activities. Tourism products which are directly connected with the agrarian environment, agrarian products or agrarian stays." Agritourism is a form of niche tourism that is considered as a growth industry in many parts of the world, including Australia, Canada, the United States, Srilanka, and the Philippines. Other terms associated with Agritourism are "agritainment",

"value added products," "farm direct marketing", and "sustainable agriculture. It is noted about Agritourism business in U.S., —Nature tourism and Agritourism are the two fastest growing segments of the tourism market in the U.S., with 30% growth expected in the period 1997-2007. According to a nationwide study conducted by Barry JJ, Hellerstein D. in 2004, 62 million Americans visited farms one or more times in 2000, which corresponds to almost 30% of the population. Agritourism and other forms of on-farm diversification have grown into an increasing requirement for financial stability in farm businesses across Western Europe. Indian policy makers had conventionally neglected the tourism industry as it was considered to be a luxury segment benefiting only few. As then, the Indian financial system depended a lot on agriculture, the government policies had always aimed to develop agriculture and other allied areas. Tourism was always looked as an industry serving the privileged instead of being accepted as a means to provide employment with good "multiplier effect".

### Requirement of Agro Tourism

1. **Infrastructure:** Accommodation facilities at same place or alliance with nearest hotels. Farmhouse, which has the rural look and feel comfortable along with all minimum required facilities. Rich resources in agriculture namely water and plants at the place. Cooking equipment's for cooking food, if tourist have interested. Emergency medical cares with first aid box. The well or lake or swimming tank for fishing, swimming. Bullock cart, cattle shade, telephone facilities etc.
2. **Facilities:** Offer authentic rural food for breakfast, lunch and dinner. Farmers should offer to see and participate in the agricultural activities. Offer an opportunity to participate in the rural games to the tourist. Provide information them about the culture, dress, arts, crafts, festivals, rural traditions and also give possible demonstration of some arts. Offer bullock cart for riding and horse riding, buffalo ride in the water, fishing facility in your ponds or nearest lake. Offer fruits, corns, groundnuts, sugarcane and other agro-products as per availability. Show local birds, animals and waterfalls etc. and give authentic information about them. Must provide safety to tourists' with the support of alliance hospitals. Available some agro-product to purchase to the tourist.
3. **Miscellaneous:** Offer pollution free environment to the tourists. Try to create interest about the village culture for the future tourism business. Introduce the tourists with imminent persons of your village. Employ well-trained staff or funny persons with good communication skill to entertain the tourist. To have authentic information regarding to the railway and bus time table for the help of tourists. Farmer can also provide other additional facilities to their requirements for the better satisfaction of tourists.

### Beneficiaries of Agro Tourism

#### 1. Farmers:

1. Expanding farm operations
2. Using farm based products in new and innovative ways
3. Improving farm revenue streams
4. Developing new consumer market niches
5. Increasing awareness of local agricultural products
6. Increasing appreciation of the importance of maintaining agricultural land.
7. Channeling additional on-farm revenues directly to family members.
8. Improving farm living conditions, working areas & farm recreation opportunities.
9. Developing managerial skill and entrepreneurial spirit; and
10. Increasing the long term sustainability for farm businesses.

#### 2. Communities:

1. Generating additional revenue for local businesses and services from tourists;
2. Upgrading / revitalizing community facilities for residents and visitors;
3. Increasing protection of rural landscapes and natural environments for tourists and residents;
4. Helping preserve and revitalize local traditions, art and craft;
5. Promoting inter-regional, inter-cultural communication and understanding;
6. Increasing awareness of agricultural issues and values among the public;
7. Promoting the on-going use of local agricultural products and services;
8. Helping to diversify & strengthen rural economy via job & income creation
9. Providing a more energetic business environment for attracting other businesses and small industries.

#### 3. Problems Of Agro Tourism

1. Lack of perfect knowledge about the Agro Tourism.
2. Weak communication skill and lack of commercial approach of the small farmers.
3. Lack of capital to develop basic infrastructure for the agro-tourism.

4. Ignorance of the farmers regarding the type of activities.
5. Presence of unorganized sector in the Agri-Tourism.
6. Ensuring hygiene and basic requirements considering urban visitors
7. Lakhs of farmers have small size holding, low quality land and little or no access to credit or irrigation.

### Conclusion

India has a great potential to the development of agro-tourism, because of natural conditions and different types of Agri products as well as variety of rural traditions, festivals. More than 45 percent of population is live in the urban areas and they want enjoy rural life and to know about the rurallife. It is a good opportunity to develop an agro-tourism business in Maharashtra. But there is a problem of low awareness about this business in the farmer and problem of the finance and proper view in the farmers of the India. Hence, the agriculture departments of the districts', Agriculture Universities should try to give orientation about it and provide some innovative ideas regarding to the Agro-Tourism. The government should try to provide optimum financial aids to the agro-tourism activities in the India by the grants and institutional finance. Bank should provide optimum financial help for the agro-tourism activities in the Maharashtra. Union of the agro-tourism service providers is also another need of these farmers which helps to the agricultural tourism network in the India including India.

### Suggestion:

- Create the awareness among the people of farmers.
- Government provide subsidiaries, capital to the development of infrastructure.
- Create effective communication and give training to the interested people.
- Give wide publication to Agro Tourism.

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## Study The Challenges And Issues Of Agro Tourism In Maharashtra

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### Abstract:

*Agrotourism is a tour to a working farm providing a fresh and live experience of various farm activities and agricultural background. It includes food, fun and farming apart from bullock cart rides and exposure to the rural set up. Agri-tourism could become a good support for additional and regular revenue to the local farmers and could also contribute to the social development through rural employment. In fact it is more a need for Maharashtra farmers. If the venture of agri-tourism works successfully in , it could lead to economic stability to the rural population and reduce the social unrest to a greater extent. It is obvious that Maharashtra as an emerging country would attract more tourists and would grow demographically as well. This is a positive indicator for the growth of rural tourism initiatives around Maharashtra. This research paper studies the existing scenario, growth and future possibilities as well limitations for agri tourism ventures in Maharashtra.*

**Keywords:** Agri-tourism, Maharashtra, Farm activities, Agriculture

### Introduction

Maharashtra is primarily a cultural destination not only in international tourism but in domestic tourism also. Tourism is also growing as an industry in Maharashtra. In recent years a phenomenal growth in tourism is observed in Maharashtra; inbound as well as outbound. Though tourism as an industry is contributing to the GDP and it is considered as a smokeless industry there are certain trends that are developing to avoid the impacts of tourism at the destination. There is a gradual shift in tourism demand from mass to niche tourism. Special Interest Tourism (SIT) which encompasses various niche tourism segments is an emerging field. This trend has resulted in various new forms of tourism like adventure tourism, eco-tourism, wild life tourism etc. Agro tourism is one such form of tourism which has recently emerged in Maharashtra. It is a field with potential to develop. Certainly as a newly developing field it has its own share of challenges and management issues to face. The issues like guest host relationship, sustainability, economic feasibility are important for any new tourism development at a destination. It is more so in the case of agro tourism as it has a direct impact on the host culture and rural community as a whole.

### Research Design And Methodology

#### 1.1. SELECTION OF RESEARCH TOPIC

This paper focuses on current status of Agro Tourism in Maharashtra. And various challenges of Agro Tourism in India.

#### 1.2. SIGNIFICANCE OF THE STUDY:

The research paper will help to know the concept of Agro Tourism. Present study tells how the Agro Tourism will be affected the Agriculture sector. Here, in this research paper, the attempt has been made to focus the important problems and issues of Agro Tourism in Maharashtra.

#### 1.3. OBJECTIVES OF THE STUDY

1. To review the concept of Agro Tourism.
2. To study the challenges and issues in Agro Tourism.

#### 1.4. RESEARCH METHODOLOGY

The process used to collect information & data for the purpose of making business decisions. The methodology may include publication research, interview, surveys and other research techniques & could include both present & historical information. The researcher has used only secondary data that has been collected from various articles, journals, books, websites etc. This has been used to study the conceptual framework, definition, present trends and some of the challenges of Agro Tourism in Maharashtra.

#### 1.5. LIMITATIONS OF THE STUDY

1. The study has been conducted only by collecting the secondary data.
2. The scope of study focuses on Agro Tourism in Maharashtra

### Concept Of Agro Tourism

Agro tourism is the form of tourism which capitalizes on rural culture as a tourist attraction. It is similar to ecotourism except that its more to cultural landscape instead of natural land-scape. If the attractions on offer to tourists contribute to improving the income of the regional population, agro tourism can promote regional development. To ensure that it also helps to conserve diversity, the rural population itself must have recognized agro biodiversity as valuable and worthy of protection. The agro-ecotourism is synonymous with agro tourism.

A number of destinations have stay-over facilities with a wide range of non-agricultural activities to enjoy as well, including fishing, kayaking and nature walks. In many cases, full room and board packages are available, meaning that guests get to indulge in local home-cooking as well. Agro-tourism has a number of attractions, both to the visitor and the host. While it provides for interesting visits and discovery, it also serve as research and development hubs for the perpetuation and improvement of the agricultural industry in the country.

Agri-tourism as it is defined most broadly, involves any [agriculturally](#) based operation or activity that brings visitors to a [farmer ranch](#). Agritourism has different definitions in different parts of the world, and sometimes refers specifically to [farm stays](#), as in Italy. Elsewhere, agri-tourism includes a wide variety of activities, including buying produce direct from a farm stand, navigating a [corn maze](#), slopping hogs, picking fruit, feeding animals, or staying at a bed and breakfast (B&B) on a farm.

Agritourism is a form of niche tourism that is considered a growth industry in many parts of the world, including Australia, Canada, the United States, and the Philippines. Other terms associated with agri-tourism are "agritainment", "value added products", "farm direct marketing" and "sustainable agriculture". People have become more interested in how their food is produced. They want to meet farmers and processors and talk with them about what goes into [food production](#). For many people who visit farms, especially children, the visit marks the first time they see the source of their food, be it a [dairy cow](#), an ear of [corn](#) growing in a field, or an [apple](#) they can pick right off a tree. Farmers and ranchers use this interest to develop traffic at their farm or ranch, and interest in the quality of their products, as well as awareness of their products.

### Challenges In Agro Tourism

- 1. Rural Market:** Rural markets are often characterized by rural population and majority of them still come under below Poverty Line. These villagers are less involved in showcasing their culture and heritages in front of the tourists visiting their places as they are not very much aware of the potentiality of rural tourism that can act as an alternative source of earning and therefore there will be lesser need to go to nearby town in search of job. Moreover, most of the rural markets are underdeveloped with lots of hindrances. Long distance from nearby towns, absence of proper mode of surface transportation, lack of basic infrastructure, inadequate lodging – fooding facilities, inconsistent electricity, tele-communication problem etc. cause difficulties to attract valued consumers (tourists) in many rural sites though those are very much promising in term of the availability of tourism resources.
- 2. Communication:** There is no doubt that communication skill is an essential tool for producers, marketers and suppliers to draw the attention of potential buyers. The difference in languages and lack of basic education are the two basic obstacles for the rural marketers. Much of the success of tourism marketing depends on the ability to give warm welcome to the guest, to understand the clients' (here tourists) demand and to provide right services at right time.
- 3. Legislation:** Generally, owners of licensed accommodation units pay taxes to the government. But it is kind of burden for the poor rural marketers to pay tax at a regular basis as they lack sufficient financial backing and many a time they face losses in business because of seasonal demand.
- 4. Financial Support:** Most of the rural tourism marketers come from the poor family background and not every timethey are financially supported by the local banks or local Government bodies through loanfacilities. Therefore, though these marketers have unique business ideas, most of the timebecause of insufficient fund, inadequate technical knowledge and skill they fail to startupbusinesses as per their desire.
- 5 Lack of Training:** The success of rural tourism depends on the quality of hospitality service from welcome to seeoff the tourist as we all know the first impression is the last impression. But in rural areas, lack oftrained human resource is a common issue that affects directly the tourism and hospitalityindustry badly. Moreover, the trained people from urban areas normally are not interested ingoing to rural areas to work due to lack of basic infrastructure facilities.
- 6. Physical Communications:** Proper drinking water, sufficient electricity, good telecommunication, safety and security, etc. are the few basic needs of a tourist while he or she is visiting any place individually or in



agroup. It is unfortunate but true that nearly half of the villages in this country do not have allweatherroads and above said basic facilities.

### Issues:

- 1.Lack of perfect knowledge about the agro-tourism
- 2.Weak communication skill and lack of commercial approach of the small farmers
3. Lack of capital to develop basic infrastructure for the agro-tourism
4. Ignorance of the farmers regarding to the type of activities
5. Presence of unorganized sector in the Agri-Tourism industry.
6. Ensuring hygiene and basic requirements considering urban visitors
7. Lakhs of farmers have small size holding, low quality land and little or no access to credit or irrigation. Have to negotiate with consistent drought.

### Conclusion:

Maharashtra is primarily a cultural destination not only in international tourism but in domestic tourism also. Tourism is also growing as an industry in Maharashtra. In recent years a phenomenal growth in tourism is observed in Maharashtra; inbound as well as outbound. Though tourism as an industry is contributing to the GDP and it is considered as a smokeless industry there are certain trends that are developing to avoid the impacts of tourism at the destination. A number of these destinations have stay-over facilities with a wide range of non-agricultural activities to enjoy as well, including fishing, kayaking and nature walks. In many cases, full room and board packages are available, meaning that guests get to indulge in local home-cooking as well. Agro-tourism has a number of attractions, both to the visitor and the host. While it provides for interesting visits and discovery, it also serve as research and development hubs for the perpetuation and improvement of the agricultural industry in the country.

**Suggestions:** For the purpose of overcoming the problem and accept the challenges the following suggestions to be considered:

1. It is recommended to state and central Government to develop infrastructure, Rural Market to develop modern techniques of communication, end of License Raj, and provide financial support and training facilities to the people.
2. Create awareness among the people regarding Agro Tourism and accept commercial approach about Agro Tourism.

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## Irrigation Facilities and Its Impact on Cropping Pattern: A Case Study

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### Introduction

Irrigation is one of the indispensable ingredients of agricultural activities. The availability of adequate irrigation facilities transforms agriculture from subsistence to commercial one. Where irrigation facilities are available, farmers prefer to cash crops. As well as India, Kolhapur is basically an agricultural region. Therefore, the need for sufficient water supply for agriculture is always felt. The monsoon is the main source of water which is characterized by uncertainty and it is also unevenly distributed in the region. It commences from month of June and brings to an end in September. Latter month of the monsoon is very critical for agriculture. Therefore, artificial irrigation facilities are very important not only agriculture but all economic activities. After independence of India, central as well as state government has implemented number of policies and programmes for development of irrigation which resulted to increasing irrigation facilities in the district. These irrigation facilities have brought agricultural change especially change in cropping pattern. Therefore, it is need to focus on irrigational facilities and the cropping pattern in the district. In the present study an attempt is made to examine the irrigational facilities and cropping pattern in the command area Kumbhi-Dhamani Co-operative Dam Society, Kale (District Kolhapur).

### Objectives

1. To study the profile of irrigation in Kolhapur District
2. To study the irrigation and cropping pattern the study area

### Methodology

To examine the irrigational impact on the cropping pattern, both primary and secondary data has been used for the present study. The data has been collected from various books, journals, socio-economic abstracts, while the primary data has been collected from sample farmers in the command area of Kumbhi-Dhamani Co-operative dam Command area. Out of total 22 villages under the command area, six villages were selected and 10 sample farmers these villages were selected for the study. So the number of sample farmers was 60. The necessary data has been collected with structured questionnaire. To analyse the data, tabulation and computerization method were used and simple statistical methods has been applied.

### Irrigational Profile in the District

Before Independence and especially beginning of twentieth century, Rajarshi Chhatrapati Shahu had greatly contributed in the field of irrigation through Radhanagari Major Irrigation Dam Project which is built on river Bhogavati, but after independence the special efforts of the central as well state government efforts the area under irrigation is increased. The details of irrigational facilities are shown in the following table;

**Table No. 1: Irrigational Profile of Kolhapur District 2012-13**

Sr. No.	Irrigation Facility	Number Projects
1	Major Irrigation Project	04
2	Medium Irrigation Project	12
3	Minor Irrigation Project	91
4	Kolhapur Type Weirs	295
5	Co-operative Dams	07
6	Percolate Tanks	147
7	Wells	28876

Source: GOI, Socio-Economic Survey, Kolhapur District: 2012-13, p.p. 41

It is seen from the above table that 4 major irrigation projects, 12 medium irrigation projects, 91 small irrigation projects, 147 percolate tanks and 295 Kolhapur type weirs have been constructed in the district. The special feature of irrigational facility is seen in the district, it is known as Cooperative irrigation Dams, these dams have been contributing in agricultural development in the command area.

It is necessary to focus on the area under irrigation in the district. Therefore tahsil-wise area under irrigation is shown in the following table;

**Table No. 2 Irrigated Area in the District (in hectares)**

Sr. No.	Tahsils	Minor Irrigation Project		Medium Irrigation Project		Major Irrigation Project	
		GCA	IP	GCA	IP	GCA	IP
1	Shahuwadi	7990	4223	18366	7999	8877	6688
2	Panhala	2093	2578	12786	9200	8444	9180
3	Hatkanangale	2177	1293	0	0	27854	25022
4	Shirol	487	172	0	0	25448	19533
5	Karveer	1169	1388	2611	1924	25812	25748
6	Gaganbavada	30	1349	7662	3641	0	0
7	Radhanagari	1373	740	18560	544	10475	10475
8	Kagal	2349	3571	7986	5295	21016	21016
9	Bhudargad	1924	1805	12754	4030	3729	3729
10	Ajara	4202	2808	4756	7975	0	0
11	Gadhinglaj	4161	3028	5435	8065	0	0
12	Chandgad	8462	5011	5030	10325	0	0
	Total Area in the district	35357	27966	95946	58998	121391	121391

Source: Socio-Economic Survey, Kolhapur District, 2013-14, p.p. 42 and 43

### Operational Land Holding of Respondent Farmers

Total land holding as well as average land holding of all respondent farmers are shown in the following table and graph;

**Table No.3 Operational Land Holding (in Hectares): 1995-96 to 2015-16**

Land Holding	2015-16
Total Number of Family	60
Minimum	0.05
Maximum	6
Total Land Holding (in Hectare)	66.86
Mean/Average Land Holding	1.11

Source: Field survey, 2015-16

Data presented in the above table shows operational land holding of respondent farmers. It is observed the average land holding of the sample farmers were 1.11 hectares. The Highest land holding was noticed 6 hectare while lowest land holding was mentioned 0.05 hectare. The average land holding of the sample farmers was showing very low holding.

### Land under Irrigation and Non-irrigation of Respondent Farmers

**Table No. 4: Irrigated and Non-irrigated Land (in Hectare)**

	2015-16
Irrigated Land	54.99 (82.25)
Ave. Irrigated Land Holding	0.91
Non-irrigated Land	11.87 (17.75)
Ave. Non-irrigated Land Holding	0.19
Total Land	66.86 (100)

Source: Field survey, 2015-16

Note: Figure in the parenthesis indicates percentage to the total land

Figures in the above table no. 3 shows that the total land under irrigation of the respondent farmers was 54.99 hectares and in percentage it was 82.25 percent, while land under non-irrigation was 11.87 hectares with 17.75 percent. Average land holding under irrigation was observed 0.91 hectare and in non-irrigated was found 0.19 hectare. It is examined that the most of the land of the sample farmers were under irrigation.

### Cropping Pattern in the Irrigated Area:

The cropping pattern in irrigated and non-irrigated areas of the command area of Kumbhi-Dhamani Cooperative Dam Society, Ltd Kale is shown in the following table.

**Table No.5: Area under Various Crops of Respondent farmers: 1995-96 to 2015-16  
 (Land in hectares)**

Crops	2015-16	
	Area under Crop	Percentage to the Total Sown Area
<b>Irrigated Area under Crops</b>		
Sugarcane*	41.13	63.78
Rice	11.48	17.80
Wheat	0.69	1.07
Groundnut*	1.67	2.59
Sunflower*	0.61	0.95
Vegetable*	0.99	1.53
Others*	2.40	3.72
Total Irrigated Sown Area	58.96	91.44
<b>Non-Irrigated Area under Crops</b>		
Rice	3.75	5.81
Jowar	0.25	0.39
Nachana	0.26	0.40
Groundnut	1.15	1.79
Total Non-Irrigated Sown Area	5.41	8.39
<b>Total Sown Area</b>	<b>64.48</b>	<b>100</b>
Non-Sown Area	2.38	
Total Area	66.86	

Source: Field survey, 2015-16

\*: Indicates Cash Crops

The data of the above table shows that out of total sown area 91.44 percent land were under irrigation and only 8.39 percent area were under non-irrigation. It is examined that irrigational facilities are impacted on cropping pattern. Farmers are more preferred cash crops where irrigational facilities availed.

In the command area it is seen that sugarcane is the most dominant crop. Out of total sown area, highest 63.78 percent land was under sugarcane crop and in case of irrigated land this percentage was 69.75 percent. It means majority of the land under irrigation was under sugarcane. There were about 20 percent land of the irrigated areas was under food crops. Rice was the main food crop in the command area. The land under wheat was shown negligible and it was only 1.17 percent to the irrigated area. Land under oilseeds and vegetables was also observed in the irrigated area and in percentage to the total irrigated area it was about 10 percent.

In case of non-irrigated area it was observed that most of the lands were under food crops and in percentage it observed more than 95 percent. Rice was the main crop in non-irrigated area. Out of total non-irrigated area about 70 percent land was under rice crop. After rice, farmers in the command area were preferred groundnut, *nachana*, *jowar*, *tur* etc.

### Multiple Cropping

Multiple cropping is the practice of growing two or more crops in the same piece of land during a single growing season. In the double-cropping, second crop is planted after the first crop has been harvested (Bunnet R B 2002, p.98). In the command area of co-operative dam society, out of total sample households, 86.92 percent sample households were followed multiple cropping patterns, while 13.08 percent sample households were followed single crop pattern for the year 2015-16. Among the sample households those followed multiple cropping pattern most of the farmers were preferred for maize as second crop following next crop were vegetables, groundnut, sunflower and onion. The Multiple cropping patterns were used only in irrigated area.

It is seen that irrigation affects the cropping pattern. Where the irrigational sources are availed farmers preferred to more cash crops which helps them to get sufficient amount. These irrigational facilities also affect the agro-based industries as well as all kinds of the industries. Due to the irrigational sources in the command area of the cooperative dam, a cooperative sugar factory is established in the command area and other allied firms are also formed. Banks, cooperative credit societies and other credit institutions helps to the agriculture sector. All these help the socio-economic development of the people in the command area.

### Conclusions

It is examined from the above study that irrigation is one of the indispensable ingredients of agricultural activities. The availability of adequate irrigation facilities transforms agriculture from subsistence to commercial one. Where irrigation facilities are available, farmers prefer to cash crops. As well as India, Kolhapur is basically an agricultural region. These irrigation facilities have brought agricultural change especially change in cropping pattern.

In the command area of cooperative dam society (Kumbhi-Dhamani) it is observed that sample farmers in the command area are preferred cash crops in the irrigated area especially sugarcane crop. Out of total irrigated areas, more than 75 areas were under cash crops and out of total cash crops about 90 percent areas were under sugarcane crop. It means sugarcane is dominant crop in the command area. Security of production, price and market farmers are more preferred to the sugarcane crop in the command area. While in the area of non-irrigated, most of the lands were under food crops. It means irrigational facilities affect the cropping pattern.

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## The Study Of General land use and cropping pattern of Kavathe Mahankal Tahsil. (Dist.:Sangli.)

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### Abstract -

*Agriculture being a basic activity plays a vital role in Indian economy in which 78.8% people are engaged in this activity. Agriculture is affected by physio socio Economic, as well as organizational factors. Still the Indian agriculture gamble with the monsoon, specifically in draught prone areas. Inadequate rainfall of monsoon and frequent drought conditions affects on general land use and hampered the development of agriculture of the region, resulting in high fluctuations in production.*

*The Tahsil Kavathe-Mahankal of Sangli District is selected for study which falls in drought prone area of Maharashtra. The paper aims to understand the general land use and to analyse the associated cropping pattern as a sample study of draught prone area. The very low and inadequate rainfall of this area dominates the land use and cropping pattern. Farming system and crop-combination of arid and subarid areas is called dry farming.*

*The varieties of crops are produced in this region but, the foodgrains are the major crops of this area which posses highest proportion of land (96%) of the net sown area. Generally the rainfeed crops are the major crops of this area as Kharif and Rabbi Jawar, Bajara and Pulses which is specific cropping pattern of the draught prone area. The answer for problem of dry land farms lies upto a great extent, in the expansion of irrigation facilities and the need of education for water management at farm level.*

### Introduction:

In India, agriculture is a basic activity which accounts one fourth of the National income & Provides employment to 65% of working population, and still it gambles with the monsoon and about 40% area is irrigated by inadequate water resources. The Indian agriculture is totally depends upon the south – west monsoon which is uncertain, causes high fluctuations in the agricultural production. Specifically in drought prone area, the inadequate rainfall of monsoon with frequent drought conditions affected on general land use and hampered the production and development of agriculture.

The cropping pattern simply means the proportion of the area under different crops. It is related to the ecological situation, socio-economic conditions and other technological factors.

**Study area :** The Tehsil Kavathe-Mahankal of Sangli district (Maharashtra) is selected for the study. Which is situated in the eastern part of the district. The study region lies between 16<sup>0</sup>, 15' North to 17<sup>0</sup>, 16' North latitude and 74<sup>0</sup>, 45' East to 75<sup>0</sup>, 16' East Longitude and altitude is about 750 mts from sea level the Kavathe-Mahankal tehsil comprises an area about 732.2 km and supports population 144596 according to census 2001. However, agriculture is a basic activity of this region, it is highly affected by the drought prone conditions and the scarcity if water for agriculture.

### Objectives :

- (1) To understand the general land use pattern of the study region.
- (2) To Analyse the cropping pattern of study region and solution.find out the solution to suggest.

### Database and Methodology:

This work is entirely based on the secondary data source. The secondary data is collected from published and unpublished report and abstract such as socio-economic review, Agriculture and Tehsildar office of Kavathe-Mahankal and agriculture department Zilha Parishad Sangli.

The following methodology is adopted for the study.

- (1) The revenue circle is considered area unit for the study.
- (2) The area under different crops is considered and viewed from the year 2002-2003 to 2006-2007 and the analysis are restricted only for the year 2006-2007.

- **General Land-use :**

Land is a basic natural resource. Land and water resources plays a major role in the development of any region. The proper utilization of land and water resources of a region helps to achieve the desired level of development (Mathur and Binda 1990)

The land-use pattern of this study area means the proportion of the area under different land-use. It is invariably determined by different physio-socio-economic factors. The land utilization has a specific significance in the study region; because of the agriculture is a dominant occupation. The land-use classification is based on census classification. Accordingly the land-use is grouped under five major categories namely, Area under forest, Area not available for cultivation, other uncultivated excluding fallow land, Fallow land and Net area sown.

**Table No. 1.1 Circlewise Landuse of Kavathe Mahankal Tehsil**

S.N.	Item	Kuchi	%	Kavathe Mahankal	%	Deshing	%	Total	%
I.	Area under forest	89.30	0.12	440	0.63	342	0.50	871.30	1.25
2.	Area not available for cultivation	2088	3	5450.40	7.81	2945	4.23	10483.40	15.04
3.	Other uncultivated area excluding fallow land	5555	7.96	1559	2.23	1961.30	2.83	9075.30	13.02
IV	Fallow land	1939.30	2.79	1650.30	2.36	488	0.70	4077.60	5.85
V	Net area sown	15104.20	21.66	18406.30	26.42	11684.70	16.76	45195.70	64.84
	a) Irrigated land	2201	4.84	2293	5.10	1502	3.32	5996	13.26
	b) Non Irrigated land	13042	29.09	16009	35.20	10148.70	22.45	39199.70	86.74
	Total	24775.8	35.53	27506	39.45	174205	25.02	69703.30	100

Source : The tehsil office and agricultural office Kavathe-Mahankal-2000.

The study area possesses 69703.30 hec. of geographical area. The category-wise distribution of land-use is as under –

I) Area under Forest: 871.3 hectars of land is covered by the forest and it accounts only 1.25% to the total geographical area. The forest area is concentrated in the hilly and steep part of Kavathe-Mahankal tehsil. Specifically in hilly area of the western and northern side of the study area.

The Govt. department of forest and social forestry have planted the species and developed the forest area in study area. They are Mhaisal (M), Karoli (T), Sarati, Kongnoli, Haroli, Boregaon, Alkud (M) in Deshing circle; Kuchi, Jakhapur, Shelkewadi, Kundlapur, Garjewadi, Tisangi, Raywadi, Nagaj, Ghatanandre, Ghorpadi, Shindewadi (G), Jambhulwadi, Chudekhindi in Kuchi circle on hill tops. Besides this, concentration of trees are also observed alongwith the Agarani river system and other small streams of the area. In Kuchi circle 89.30 hec. (0.12%), Kavathe-Mahankal circles 440 hec. (0.63%) and Deshing circle 342 hec. (0.50%) land under forest is observed. Very low percentage is observed under forest in this study area. (See Table – 1.1)

II) Area not available for cultivation : Area under this category includes the land not under agricultural use. Barran and uncultivable waste land and that is the 10483.40 hec. of land in the study area (15.04%). This land is found scattered in this study area. In Kuchi circle 2088 hec. (3%) Kavathe-Mahankal circle 5450.40 hec. (7.8%), Deshing circle 2945 hec. of land (4.23%) is observed.

III) Other unclutivated area excluding fallow land : This category includes permanent pastures, other grazing lands, land under trees and groves, cultivable wastes is not included in the net area sown. It is about 9075.30 hec. of land is under this category. It accounts About 13.02% land is out of total geographical area comes under uncultivated area excluding fallow land. In Kuchi circle 5555 hec. (7.96%) Kavathe-Mahankal circle 1559 hec. (2.23%) and Deshing circle 1961.30 hec. (2.83%) possess the area of this category.

IV) Fallow land : There are two types of fallow lands, one is a current fallow land and second is (permanent) fallow. The fallow land covered about 4077.60 hec. (5.85%) to the total geographical area. This type of land is particularly in Kuchi circle is about 1939.30 hec. (2.79%) Kavathe-Mahankal circle is about 1650.30 (2.36%) and Deshing circle is about 488 hec. (0.70%) land in this category is observed.

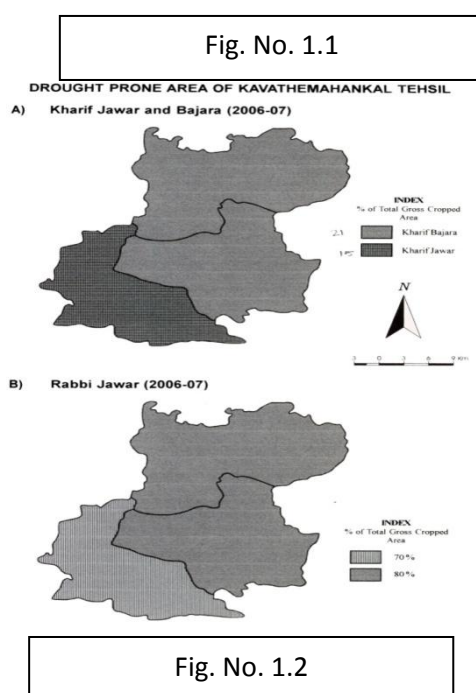
V) Net sown area: The net sown area share is about 45195.70 ha. of land which accounts 64.84% out of total geographical area. The village level analysis exhibits the variation in sown area it shows that the high proportion is observed in southern side of Agarni river and South-Eastern part of this tehsil. Considering the circle In Kuchi circle 15104.20 hec. (21.66%) Kavathe-Mahankal circle 18406.30 hec. (26.42%) and in Deshing circle 11684.20 hec. (16.76%) area is under net sown area.

**Irrigated and non-irrigated land :** High proportion of non-irrigated land and very little area under irrigation (well, tubewell & canal) is observed in study area. In Kuchi circle, non-irrigated land is about 13042 hec. (29.09%) and irrigated land is about 2201 hec. (4.84%) in Kavathe-Mahankal circle non-irrigated land is 16009 hec. (35.20%) and irrigated is 2293 hec. (5.10%) and in Deshing circle, non-irrigated land is 10148.70 hec. (22.45%) and irrigated is 1502 hec. (3.32%) (See Fig. 1.1)

**Cropping Pattern:** The drought prone condition of the study area clearly reflects in the cropping pattern of this region, there is close positive perfect co-relation in between rainfall distribution and cropping pattern of this area.

While we consider the cropping pattern of the year 2002-2003 to 2006-2007 it is observed that, the tehsil Kavathe-Mahankal gets very low rainfall which is below 150 mm, and affects badly on sown area of this region, which minimize up to 50% area in the year 2002-2003 (33330 Ha) and only one fourth area is observed under cultivation for the year 2003-2004 (16285 Ha). Accordingly, about 221.5 mm rainfall was enjoyed by this area which, influenced positively on the cropping pattern of this area and the total area under various crops is reached up to the (60839 Ha) in the year 2004-2005 in the both the seasons. (see table 1.2)

Area under jawar and bajara in Kavathe Mahankal Tashil



**Table No. 1.2 Area under different crops from year – 2002 -2003 to 2006-2007.**

Crops	2002-03		2003-04		2004-05		2005-06		2006-07	
	Area In Ha	Area in % to Total G.C.A.	Area In Ha	Area in % to Total G.C.A.	Area In Ha	Area in % to Total G.C.A.	Area In Ha	Area in % to Total G.C.A.	Area In Ha	Area in % to Total G.C.A.
Kharif Jaowar	3685	11	465	2.86	9970	16.40	9134	16.22	9871	15.29
Rabbi Jowar	16805	50.42	9682	59	19940	32.80	18530	32.90	18570	28.77
Bajara	6255	18.77	670	4	15950	16.22	13720	24.36	13651	21.15
Maize	225	0.68	25	0.15	875	1.44	575	1.0	1305	2.02
Wheet	950	2.85	427	2.60	2110	3.47	1225	2.18	1819	2.92
Other Cereais	720	2.16	545	3.35	3040	5.00	2870	5.0	3227	5.0
Gram	1650	4.95	2750	16.90	2750	4.52	2530	4.49	2423	3.76
Tur	358	1	65	0.40	1105	1.82	910	1.62	1280	1.98
Matkai	82	0.25	70	0.43	110	0.18	192	0.34	223	0.34
Other Pulses	228	0.68	545	3.35	720	1.18	2870	5.0	5690	8.81

Sugar Cane	1000	3	125	0.77	782	1.30	609	1.0	1348	2.08
Condiment & Spices	48	0.15	54	0.33	123	0.20	168	0.30	240	0.40
Total Vegetable	65	0.20	64	0.4	185	0.30	294	0.52	209	0.32
Total Fruit's	239	0.72	133	0.81	205	0.34	286	0.51	296	0.50
Cotton	150	0.45	125	0.77	100	0.16	60	0.11	219	0.35
Groundnut	50	0.15	25	0.15	725	1.20	825	1.46	1050	1.62
Soyabean	490	1.47	48	0.30	1350	2.22	460	0.82	1620	2.51
Other oilseeds	50	0.15	90	0.55	340	0.56	490	0.87	630	1.0
Fodder's	280	0.95	377	2.88	459	0.69	570	1.3	790	1.22
Total Gross Cropped Area	33330	100	16285	100	60839	100	56318	100	64539	100

Source Tehsil Office Kavathe Mahankal and Agriculture Dept. Zilla Parishad Sangli.

In the next year (2005-2006) this area enjoyed about 320 mm rainfall which is comparatively high as compare to previous years, but the area under various crops in this year shows considerable decrease in the sown area. This happens so, because rain has not occurs at proper time whenever necessary to the crops.

Comparatively highest rainfall (443 mm) is enjoyed by the Kavathe-Mahankal tehsil, in study period in the year 2006-2007 which shows highest sown area (64539 Ha) in both the Kharif & Rabbi season.

#### **Conclusions :**

- Concluding the silent features of general land use of the study & cropping pattern of the study area, the drought prone nature of the area- highly dominate the land use & cropping pattern.
- According to census classification the land use is grouped under five major categories. Only 1.25% area is observed under forest because of the drought prone nature of the study area. Which is exactly half of the area under forest of the District sangli.
- Though the study area comes in drought prone zone of the Maharashtra, the Agriculture is dominant occupation in this area. Where, 64.84% area is observed as net son area to the total geographical area which is comparatively less to the District sangli.
- Dry farming is a predominant nature of agriculture of this area where, 86.74% area out of net sown area is used for dry land agriculture.
- Only 13% net sown area is irrigated through well, tubewells , and Tank's irrigation in the form of few patches of irrigated land in the study area.
- Considering the favourable geographic factors of this area, the Mhaisal and Tembhu projects will work as a boost to the agricultural development in this drought prone area in future.

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## Technologies to Escalate Agricultural Productivity and Government Projects.

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### Introduction:

Agriculture is not only occupation it is livelihood for all rural people. It is only activity providing for all the living things. There is very necessity to increase the productivity to feed the growing population. With the adoption of appropriate innovation technology in farming activity at different stage of farming process. It needs technology infusion to speed up the production and give accessibility of food to the citizens. As according to FAO 12.5% of the world population are suffering from malnutrition, and agricultural production would need 70% growth by 2050. Malnutrition get cost of 5% of GDP expenditure on treatment.

Lower level of agricultural productivity leads to shortage of foods leads to undernourishment leads to his health, it is the indicator of under development. To mitigate the malnutrition there is necessity to increase the production and provide food engage in farm sector contribution is very less to GDP.

### Productivity:

- ❖ Productivity is the major issue in agriculture. It refers to fields per hectare of food grains, vegetables, fruits etc. Productivity depends on quality of inputs, rainfall, soil health, climate, method of cultivation, technology used. Technology is the most influent factor to boost the agricultural production.
- ❖ Technology refers to method used in agricultural operations. Conventionally we have two type (1) Labor intensive (2) capital intensive. Other than these we have so many kinds of productive methods innovatively adopted by farmers. Present techniques which are widely adopted in farming are affecting the environment and quality of the production. Further they affects climate change, small holders, rain fed cropping and degraded the land. Broadly we have to know various types of technologies for agriculture and rural development.

### 1. Technology of Resource Conservation

- This related to less utilization of natural resources and reducing the cost, away from the degradation of resources. Resource conservation technology aimed at produce more at less cost of production.
- At the same way widening the natural resource bottom, maintain the quality of soil, proper method of input utilization, use of seeds of fertilizers.
- Using the less water in cropping and save more adopting the sprinkling of drip irrigation methods. These method helps to economy use of water.
- Use of farm yard manure compost instead of chemical fertilizer.
- Using intensive deep cultivation. It is also benefit for soil health micro organizing the soil and fertility of the soil in long run.
- Encouraging the subsiding production in agriculture. To increase the farm income.

### 2. High yielding cropping:

Innovation the high yielding variety of seeds input which suitable to arid areas and dry land farming which helps to produce coarse varieties of food grains those love rich nutrients, which was happened in one of green revolution, increasing the potential of small farmers. And skilled them to good maintenance of resource and cost which include ecofriendly and sustainable agriculture.

### 3. Post harvest technology

To reduce the waste of production farmer have to follow the good method of storage, A study reveals average loss to Rs.44,000crore per annum, To protect this post harvest facility is provided to the farmers, facilities to immediate landing of produce.

To be provide food processing technology at local production. for the sake of getting durability in agro production this can be Help generating employment opportunity to others.

### 4. Climate resilient technology

In India farming is depend on rainfed, water resources problem creating big crisis In this condition we have to adopt less water using cropping, pattern, Agriculture suffer from climate change and increasing temperature, As variation in climate change our farmers also adjust with sustainable method of cultivation like organic farming, green house farming, waste land protection etc.



### 5. Mechanization of agriculture

It is already happened in Indian agriculture it is also enhancing in small holding. These are all to be coup to sustainable agriculture and maintain the environmental balance

### 6. Organic farming

Advantage of this farming as reduces cost and raises production of quality of organic products is more than the chemical farming product, and they few times then harmful chemical used products. Price of these also be 10-20% higher than non-organic yield.

### 7. Contract farming

Contract farming is organizing method of agriculture. It allowsto corporates, relatives and processing companies to enter in to farming activity with agreement. This ensure steady supply and boost agro industry. It provides good flow of credit, transaction of commodity, good prices, profit distribution and participation of parents and also share holders. It gives good frame work it as widely been accepted better that self help groups involved.

We mentioned so many restarting factors to boost agricultural productivity.

- Average agricultural productively of food grains is nearly less. 23.9% growth as compare to developed countess like Japan and USA 18. Indias production is 3370/ he in japan 6,488kg/ he, in US 7672kg, in Egypt 7311kg .
- 60% of farming depend on monsoon
- Only 40% of cultivatable land to be irrigated.
- Continues draught condition somewhere of the country.
- Climate change and ecological imbalance influencing.
- No aware of new technologies to farming commenters
- Traditional method leading the agriculture operations
- Degradation of soil declining fertility and salinity
- Weak pest and insect manage.
- Lack of infrastructure
- Defective pricing and marketing policy
- Scarcity of storage
- Credit and investment problem
- Mainly Indian agriculture deprived from lack of irrigation facility

### Initiatives towards improvement in agriculture:

Improving technology means adoption of new factor innovative methods in agriculture which has higher productivity and less cost of production. Last two decades government has taken project measures to better agriculture.

**1. Canal irrigation project in 1991:** involved to increase area of irrigated land during 15 years spar

**2. National Agricultural Technology project in (NATP) 1998:**

It is dynamic instrument to agricultural research and extension system of farming sector. The project was finamial assistance by IBRD in 28 districts of states. To generate outstanding productivity, to facilitate the accelerated sustainable transformation of agriculture, support to poverty alleviation and generate rural income partnership with farmer community private sector.

**3. Agricultural Technology Management Agency (ATMA):**

It is group of agricultural staockholders in specific area. It is a gravity point for integrated and enhancing decentralizing management. Registered organization enter into contracts and agreements and maintaining accounts regarding collecting fees and operating expenses.

**4. National Horticulture Mission (2005): (NHM)**

To promote effective growth in horticulture production technologies. This missing covers 352 districts of all the states. This scheme helps creating jobs for unskilled persons. Post harvesting and marketing measures for horticulture. Rs.350325 crore released in 2014-15 and target to 6% growth. The impact of mission increasing 4.965m.has area 45.29mt of fruits, 101.43mt of vegetables, 2<sup>nd</sup> largest producer in world of fruits and vegetables.

#### **5. Support to state extension programmers for extension reforms 2005:**

The scheme promotes decentralized farmers engaging accountable system, through arrangement of technology dissemination in agriculture. It provide training /demo/ information to youth farmers, research to science economics of agriculture to develop technology to update farmer service

#### **6. RastriyaKrishiVikasYojana (2007):**

**RKVY** This help in improving, production and productivity, encourage the state to invest more in agriculture and allied sectors, govt. envisaged 25,000 crore in 12 plan. The Scheme available are development of food crops. Mechanization animal husbandry, dairying and Fisheries and development of marketing states have taken watershed, micro irrigation, seed fairs, horticulture soil test labas, Rs.4100.00 crore in spent on this in 2012.

#### **7. National Food Security Mission (2007):**

NFSM is implemented in 312 districts of 19 stes, Now it corers all the districts of the country. Mission equips the farmers with recent improved technology demonstration to farmers regarding seeds, tracing to resume management and food processing and effective monitoring.

#### **8. Micro – irrigation scheme (2007):**

To improve water use efficiency through sprinkling and drip irrigation

#### **9. National Research Centre for women in Agriculture (NRCWA)**

Is functioning some states, it gives emphasis on working women in farming system suited for women, eco-friendly pest management in vegetable farming, storage practices of seeds and gamins etc.

#### **Suggestion:**

- Improving farm mechanization
- Watershed management
- Usage of genetically improved seeds
- Efficient nourishment of crops
- Technological transformation at different stage farming
- Develop food processing industries
- Application of Bio-technology in agriculture
- Escalate the Eco-Technologies for sustainability
- Encourage private investment
- Pre and post harvesting management
- Adequate institutional support
- Water harvesting and watershed management scientifically
- Adopting zero cultivation and organism farming through sustainability

#### **Conclusion:**

Many revolutions occurred in agriculture to best the sector. These comprises Green Revolution, White revolution, Blue revolutions, Yellow revolution, Biotech revolution, ICT resolution. All relevant technologies available, regard is extension of these developed system lab to land initiative achieving up gradation of quality of life and productive potential. Labor intensive micro units in agriculture to be needed. All of us try to find innovative, less costable job oriented time saving, resource conserving methods to be adopted in further farming activities and strengthening agro sector.

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**Fruit Farming And Mango Regionalization Of Mouje Talewadi Village Of Gadhinglaj Tehshil****\*Anita S Magadum****\*\*Dr. R. V. Hajare**

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**Abstract:**

*Growing of fruit crops, including nuts called as fruit farming, primary for use as human food. Fruit crops are intensive type of perennial plants. Fruit farming helps to increase economical condition of farmer as well as nation. It helps to reduce soil degradation, Fruit farming is developing stage in Gadhinglaj tehsil. Present investigation reveals fruit farming and mango fruit regionalization of Mouje Talewadi village. The year 2017-18 has considered for the study. The entire study constructed on primary data. 10 % sample fruit growers were selected for data collection. Mouje Talewadi village have been selected as an aerial unit, and fruit crops have been selected for present investigation. Percentage values are used for calculation of mango concentration and productivity of mango calculated by simple productivity method. The highest mango concentration observed in northern part of the village (58.06%), Moderate concentration of mango observed in central part (27.39%) and lowest concentration observed in southern part of Mouje Talewadi village (14.55%). The productivity of mango is high where land holding capacity of mango is low and vice-versa. The slope, rainfall, climate, soil texture and nearest market facilities affects on the fruit farming development.*

**Key words:** Fruit Farming, Concentration, Productivity etc.**Introduction**

In recent years demand for various fruits is increased all over in world and In India, due to its nutritional, medicinal and for diet purposes. Fruit crops give much production and earning than field crops. Fruit crops are perennial type of agriculture and it contributes employment throughout year. Fruit farming is most accepted type of farming in Mouje Talewadi village due to suitable climate, soil texture and suitable rainfall by south west monsoon.

Crop concentration focuses on significant crops those may be food or cash crops. According to region the diverse variables like physiographic, climate, soil, socio-economic factors and method of agriculture affects on the crops concentration, e.g. the areas of undulating terrain and high rainfall may have the dominance of fruit crops like mango, cashew nut and jack fruit.

Overall Kolhapur district climate is suitable for mango cultivation. Most of western part of Kolhapur district is suitable for mango, cashew nut and jack fruits cultivation. This part includes Shahuwadi, Radhanagari, Gaganbawada, Gadhinglaj, Ajara, Bhudargad and Chandgad tehsil. In which Gadhinglaj tehsil is well known for mango production. More than 55 per cent villages of Gadhunglaj tehsil cultivate mango fruit crop. Mouje Talewadi village is famous for mango cultivation, due to its soil texture, climate, water suitability and nearest market availability. Mango, cashew nut, jackfruit, banana, tamarind and amla fruit crops are also play vital role in economy of Mouje Talewade village. In order to understand the agricultural system of the product like mango of Gadhinglaj tehsil the Mouje Talewade Village is selected for present investigation.

**Study Region**

Mouje Talewadi village is situated in north bank of the river Ghatprabha. This village is located at height of 554 meters above mean sea level. Geographical location of Talewadi village is 16.73° N latitude and 74.02° E longitudinal. The total geographical area of village is 485.4 hectares. The slope can be observed from east to the south directions. The Ghatprabha River flow westward direction at the south margin of the village. Overall conditions of physiographic are favorable for the development of agriculture in the Mouje Talewadi. The red, black and alluvial type of soil can be observed in this village. Alluvial soil is observed at the southern part of the region. Black soil at the central part of the village and red soil observed at the northern part of the village.

This village receives high average annual rainfall that's why Ghatprabha River able to supply their water for all months to agriculture and domestic purpose. More than 90% area of this village is irrigated. Many self-financed water lifting schemes are established by group of farmers in Mouje Talewadi. The wells and tube wells are also can be seen on large scale and these are main source of water supply for agriculture because the river Ghatprabha flows apart from village. The high average annual rainfall and low ground water level can be seen in this village. The average annual maximum

temperature is 31°C and average annual minimum temperature is 15°C recorded in this village. The average annual rainfall of the Mouje Talewadi village is 300 to 350 cm; due to the village belong from hilly area of Kolhapur district, western and southern part of village cover by forest.

### Objectives

1. To micro level study of fruit farming of Mouje Talewadi village.
2. To study mango concentration and productivity of Mouje Talewadi village.

### Data Base And Methodology

To micro level investigation about study area, primary data related to study such as fruit cropped area and working population was collected by using schedules and interview method. 10 per cent fruit growers are selected to fill up schedules in Mouje Talewadi village. After that data converted in to table for easy analysis. Per cent values used to indicate mango concentration zones of Mouje Talewadi village and simple productivity method is used for demarcate the high, moderate and low productivity areas of Mouje Talewadi village.

In the Mouje Talewadi village 92.11 hectare (25.94%) area under fruit farming out of total net sown area in 2017-18. In this village major four fruit crops are cultivated. Those are mango, cashew nut, banana, jack fruit, and other fruit crops (Termarind, guava, jamun, amla etc).

### Fruit Farming In Mouje Talewadi Village

Table No.1

**Fruit Farming of Mouje Talewadi Village (2017-18)**

Sr. No.	Fruit Crop	% to Net Sown Area	% to Fruit Cropped Area
1	Mango	14.28	55.06
2	Cashew nut	9.35	36.04
3	Banana	0.99	3.80
4	Jack Fruit	0.70	2.71
6	Other Fruits	0.62	2.38
	Total	25.94	100

Source: Based on field work.

The village Mouje Talewadi is well known for mango fruit crop from last 70 years. It is first rank fruit crop of Mouje Talewadi village i.e.50.72 hectare (14.28%) due to suitable climate, soil texture, humidity, water supply and farmers also take internal crops like rice and nagali. So the land gives more profit than field crops. The 2<sup>nd</sup> rank fruit of village is cashew nut i.e. 33.2 hectare (9.35%) due to cashew nut needs same climate like mango fruit crops growth. The 3<sup>rd</sup> and 4<sup>th</sup> largest area occupied banana and jack fruit with respect to 3.5 and 2.5 hectares respectively and 2.19 hectares (0.62%) land occupied by other fruit crops. If fruit cropped area consider as a 100 per cent then 55.06 per cent land occupied by mango, 36.04 per cent by cashew nut and lowest land occupied by other fruit crops i.e. 2.38 per cent.

### Reginalization Of Mango

Table No. 2

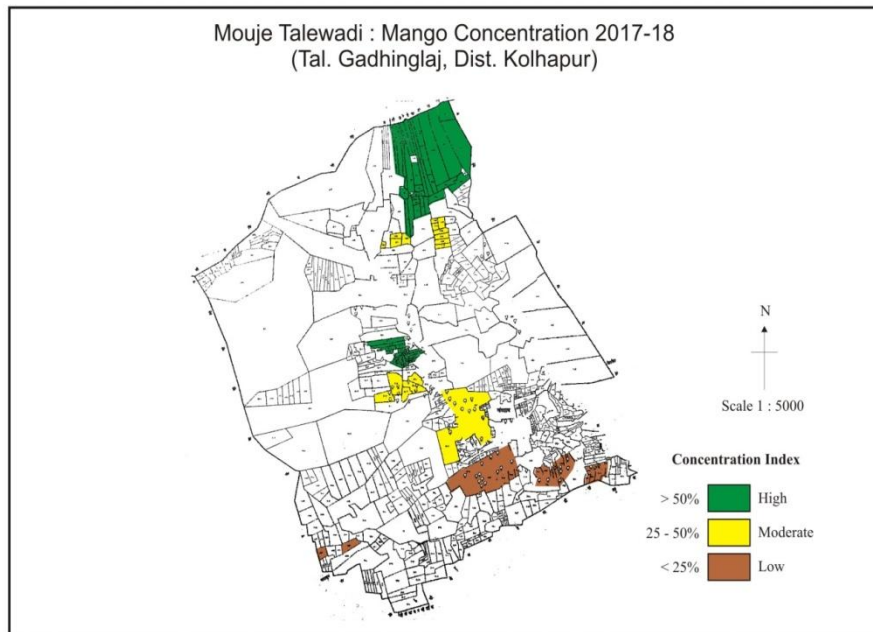
**Mango concentration of Mouje Talewadi village: 2017-18**

Sr. No.	Category	Area in Hectares	Area in %
1	High Concentration	29.45	58.06
2	Moderate concentration	13.89	27.39
3	Low Concentration	7.38	14.55
4	Total	50.72	100

Source: Compiled by Researcher.

Fig. no. 1 It shows the spatial distribution pattern of mango. The highest concentration of mango observed in northern part of the Mouje Talewadi village.

Fig. No. 1

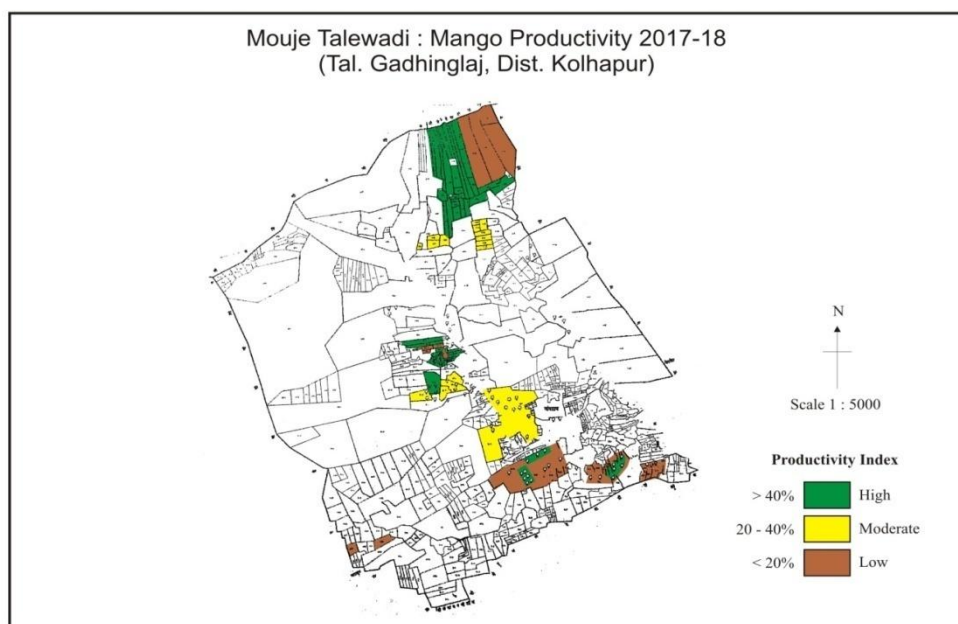


Source : District Censes Handbook, Kolhapur, Maharashtra, Cense of India 1981

Near about 58.06% land is covered by mango due to availability high temperature, heavy rainfall, and suitable soil texture and also this part is mostly come under moderate forest covered area and undulating terrain so farmers cultivate mango trees where no one crop grown up sufficient except rice and nagali. Moderate concentration of mango observed in central part of Mouje Talewadi village due to gentle slope farmers practiced other field crops. Low concentration of mango is observed at southern part of Mouje Talewadi village due to well developed irrigation facility and gentle slope suitable for cultivate food crops, sugarcane, oilseeds etc.

Fig. 2 shows the high productivity index (>40%) observed in northern and central part of the village because this part is mostly occupied by forest and patches of land which are nearest to forest devoted to mangos cultivation by farmers. The moderate productivity (20-40%) of mango is saw in central part due to land of this part is mostly engaged under oilseeds and pulses. The low productivity (<20%) observed in north-east and south-western part of the village due to near about 70 per cent land devoted to cereal crops mostly to rice and nagali.

Fig. No. 2



Source : District Censes Handbook, Kolhapur, Maharashtra, Cense of India 1981



### Conclusion

The Mouje Talewadi village is well known for mango fruit crop, more than 50 hectares land covered by mango fruit crop. The high concentration of mango is observed in northern part of the village due to sufficient water supply by rain and river schemes, soil texture and this area is mostly covered by forest that's why this part of village not suitable for traditional crops so this part is well known for mangos and cashew nut fruit crops cultivation. The moderate index value found in central part of the village due to this part is also devoted to ground nut and pulses. The low concentration of mango fruit crops is observed in south and south-eastern part of the village because these parts are plain area and farmers practiced sugarcane like cash crops and surrounded area of gaonthan is goes under current fallow land.

According to farmers interviews the low land holding mango gets high productivity and high holding of level got a low productivity.

The highest productivity observed in northern part of the village because this part is mostly occupied by forest and small patches of land which are nearest to forest devoted to mangos cultivation by farmers. The moderate productivity of mango is saw in central part due to land of this part is mostly engaged under oilseeds and pulses. The low productivity observed in north-eastern part of the village due to near about 70 per cent land devoted to cereal crops mostly to rice and nagali and sugarcane and production of mangoes is less as compare to other parts of village Mouje Talewadi village.

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## Impact Of New Agricultural Technologies On Rural Development Of Maharashtra

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### 1.1 Introduction:

The Technology has an important, role in agriculture and economic development. However, in agriculture, the pattern of technology depends not only on the quality of available technology, but also-on a number of factors like infrastructure, weather conditions, socio-economic policy and environment. Any positive interaction of technology, with these variables determines the pattern of technology. Adoption of these factors in turn influences the agricultural growth. Since the mid 1960's there has been a rapid increase in agricultural production in India as a result of diffusion of package of improved cultural practices involving High Yielding Varieties of seeds (HYVP), use of fertilizer, irrigation, pesticides, farm mechanization etc. The new technology will generate income and employment to the rural masses.

### 1.2 Concept of Technology:

Technology means the knowledge, the skill and all the available techniques applied in production to increase the output. It indicates the input mix, in the production of a unit of output. It helps to provide greater output from a given amount of input or it plays an important role in utilization of available resources. Vernon W. Ruttan points out that, "For an analytical purposes it is convenient to use the term technology referred the body or stack of techniques, procedures or Ways of conducting economic activities. The level of technology can be conceptualized in terms of an aggregate production function whose parameters reflect all of the technical production possibilities currently available." Specifically technology may be defined in terms of the proportions in which land, labour and capital are combined into the production of a unit of output. It is a function of the technological change and relative input prices. Dr. V.B. Jugale has explained that, "agro-technical progress is the one that increase the agricultural productivity of both qualitative and quantitative in the same proportions." J. G. Panse and D. Shinge states that, "technological change in agriculture consists of adoption of farming techniques developed through research which in its wake is calculated to bring about diversification and increase of production and greater economic returns to the farmers."

C. H. Hanumantha Rao defined, "Technological change in agriculture as the use of new or modern inputs such as fertilizer, high yielding varieties of seeds, tractors, pump sets, threshers and harvest combine etc. Techniques refer to the actual mix of input factors and it is a function of both technology and relative prices of input factors. Thus technological change may lead to change in techniques." Madhusudan Ghosh states that, "when techniques of production is merely identified with a vector of inputs, any change in the techniques of production can be interpreted as a partial or complete replacement of the traditional variety of inputs by a better quality of technologically advanced inputs. New agrarian technology comprises; HYVP seeds, irrigation, tractors, threshers, insecticides and pesticides, fertilizer etc."

From the analysis of the statements of the scholars regarding the agricultural technology it is realized that agricultural technology is nothing but all the techniques which are used in the field of agriculture to increase the per acre yield of agriculture. Agricultural technology consists of varieties of inputs and these inputs are essential to raise the agricultural production.

### 1.3 Objectives of the study:

1. To study the new agricultural technology in agriculture sector.
2. To analyze the impact of agricultural technology on rural development.

### 1.4 Research Methodology:

The present research paper has been depending upon the secondary data. The secondary data has been collected from various reference books, published government report, unpublished research reports, project report, unpublished research thesis, websites, annual reports etc.

### 1.5 Impact of Agricultural Technology on Rural Development:

Technology plays an important role in all production enterprises. It is most important factor in increasing the yield from any production efforts. Technology change in agriculture is still more

important because the factor, land is inelastic in supply. If agriculture is followed on traditional lines production cannot be increased to meet the need of growing population in the nation. Application of modern technology in the form of improved inputs increased the farm productivity even if the land is less fertile. T.W. Schultz explains, "the man who farms as his forefathers did not produce much no matter how rich the land or how hard the works. The farmer who has access to and knows how to use what science knows about soils, plants, animals and machine can produce an abundance of food though land is poor. Need the work nearly so hard and long." Yet in most of the underdeveloped countries agriculture is followed on the traditional lines. Individual farmers as well as the society as a whole will be the recipients of immense benefits of technology progress. The farmers will get the benefit because new technology helps to produce more output with the same resources or the same output at low cost. Hence the profit of the farmer increases at least in the foreseeable future. Technology increases the production of agricultural goods, thus in turn; increase the supply of essential goods. So, consumer will get food grains easily at reasonable prices. Subrata Ghatak and Ken Ingersent write, "with some reservations, technological progress is beneficial both to individual and society as a whole. Producers adopting improved techniques of production benefit at least in the short run, consumers and nation stands to gain from increased aggregate supplies either through the relief of actual physical scarcity or lower price or both." Adoption of modern technology in agriculture helps the individual farmers as well as the nation as a whole to attain prosperity in the growth of agriculture. Which in turn tends to help overall economic development of the country.

The adoption of new technology in agriculture has been offering a number of benefits to the individual farmers. The impact of agricultural technology on rural development has been analyzed with the help of following points.

### 1. Promotes Self- sufficiency in Food:

The technology has played a significant role in increasing food production in the world, thereby has adequately met the food requirements of the population. Due to increase in the availability of food grains, availability of proteins and calories has also increased. Some of the HYVP have higher protein content. In less developed countries population is increasing at faster rate and as such food requirements are also growing. Modernization of agriculture's the only solution to meet this additional demand for food grains. E. O. Heady rightly pointed out that, "Technological progress in agriculture is relatively more important for densely populated and new independent countries of Asia, Africa and western Europe. It is the technology progress in agriculture alone, which has allowed the food production rate in western world to outpace the population growth rate. Increased food production in poor under developed countries will only provide food self sufficiency but the super plus food production will be a source of earning foreign exchange for the nation." Thus the adoption of modern technology in agriculture will increase the food production and provide self sufficiency and food security to the nation as a whole.

### 2. Promotes Employment Opportunities in Rural Area:

Most of the underdeveloped countries are facing the problem of unemployment. Hence, there is a great need to increase the employment opportunities in agriculture. The adoption of technology in agriculture increases the employment opportunities. This is due to the Use of fertilizer, weeding, irrigation, harvesting etc., which requires more labour. The use of HYVP increases the area under double crops, which increases the employment opportunities. V. T. Raju using the regression an employment states that, "new agriculture technology has significant to an increase in the employment of labour, the application of fertilizer has significantly contributed to an increase in employment followed by irrigation, improved seeds and plant protection chemicals". Thus the application of new technology in production but also increase an employment opportunities which reduces the effects of unemployment and underemployment problems from the society.

### 3. Increase Production and Productivity of Agriculture in Rural Area:

The technology makes the production possible and technological change helps to production more with the some resources. The selection of appropriate technology helps to increase the pre-hectare output in an economy. Further, the increase in agriculture productivity is the main cause of agricultural growth in any country. Agricultural productivity only depends upon natural factors like rainfall, soil, weather conditions etc. but also the technological factors like

technological improvements. In the recent years new inputs like HYVP seeds, fertilizers, irrigation, pesticides and modern implements have increased the productivity.

#### **4. Growth in income of rural live hood:**

The adoption of technology increases the per hectare output. It also leads to greater marketable surplus and adds to the gross income of the farmers. Milton M. Shodgrass and Lather T. Wallace points out that, "the effect of technology on the farmer's gross income is adopted, e.g. the farmer who was an, "early adopter" and used hybrid seeds corn before the majority of his neighbours did, was able to increase his gross and net income considerably resulting in higher yields per acre harvested, his dollar return per acre was higher with relatively little additional cost. However, all commercial corn produces hybrid seed corn now; his low yields would lower his income. Thus, the adoption of technology increases the income of all types of farmers. But an increase in the income is not uniform.

#### **5. Promotes Marketable Surplus to rural community:**

Use of improved inputs in agriculture transformed agriculture from the subsistence level to profitable farm business level. The adoption of new technology increases not only the production but also the marketable surplus. And this is necessary for the growth of the economy. A. S. Kahlon states that, "the recent technological breakthrough in agricultural production through seed, fertilizer and revolution has accelerated the transformation of the Indian farm economy from subsistence level to a profitable agri-business with rapid diffusion of new technology. The proportion of marketable surplus rapidly increased in these areas, where Wheat revolution was established. So that, the adoption of improved inputs in agriculture creates marketable surplus in the economy.

#### **6. Increase the consumption expenditure of the farmers:**

The adoption of technology in agriculture increases the farm output and farmer's income. The increase in the purchasing power of the farmers increases the consumption expenditure. D. R. Arora, V. K. Agrawal and A. K. Gupta<sup>15</sup> after studying the benefits of "Green Revolution" and social change concluded that, "the benefits of Green Revolution were reaped by all sections of the society. Farmers have spent their increased income on improving their quality of life. Food habits and clothing pattern have also undergone changes in rural Punjab." People have become more conscious of balanced nutritious diet.

#### **7. Leads to changes in cropping pattern:**

The technological progress brings changes in the cropping pattern. The traditional varieties of crops have been substituted by HYVP seeds. The traditional crop cycle and farm practices change the farmers go in favour of high value crops rather than the low value crops. The technological change pre-supposes assured irrigation facilities. Thus the cropping intensity is increasing.

#### **8. Promotes the changes in rural economy**

The technological progress in agriculture brings changes in the socioeconomic and cultural life of the rural people. Improvements in rural education, health, life style etc. are related to technological change. Further, the technological progress in agriculture can become a means for the development of the rural economy.

### **1.6 Conclusion:**

The adoption of modern technology in agriculture will increase the food production and provide self sufficiency and food security to the nation as a whole. The application of new technology in production but also increase an employment opportunities which reduces the effects of unemployment and underemployment problems from the society. In the recent years new inputs like HYVP seeds, fertilizers, irrigation, pesticides and modern implements have increased the productivity. The adoption of technology increases the per hectare output. It also leads to greater marketable surplus and adds to the gross income of the farmers.

Farmers have spent their increased income on improving their quality of life. Food habits and clothing pattern have also undergone changes in rural Punjab." People have become more conscious of balanced nutritious diet. The technological progress in agriculture brings changes in the socioeconomic and cultural life of the rural people. Improvements in rural education, health, life style etc. are related to technological change.

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## Scope and Opportunities of Agro-Tourism for Rural Development in Maharashtra: A Geographical Study

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### Abstract:-

*Tourism is one of the fastest growing industry in the world. Several countries have transformed their economies by developing their tourism potential. Tourism has great capacity to generate large-scale employment and additional income sources to the skilled and unskilled. Today the concept of traditional tourism has been changed. Some new areas of the tourism have been emerged like Agro-Tourism.*

*Agro-tourism is a way of sustainable tourist development and multi-activity in rural areas through which the visitor has the opportunity to get aware with agricultural areas, agricultural occupations, local products, traditional food and the daily life of the rural people, as well as the cultural elements and traditions.*

*Agro-Tourism is helpful to the both farmers and urban peoples. It has provided an additional income source to the farmers and employment opportunity to the family members and rural youth. But, there are some problems in the process of the development of such centers. Hence, the government and other related authorities should try to support these activities in Maharashtra for the rural development and increase income level of the farmers.*

*The farmers should also try to establish their co-operative society for the development of agro-tourism centers. The agro-tourism may become a cash crop for the farmers in Maharashtra and also development for rural area. Maharashtra is one of the major tourist centers in the India and there is large scope and great potential to develop agro-tourism in rural area.*

### 1. Introduction:-

Tourism is one of the fastest growing industry in the world. In India, Maharashtra has the rich natural or geographical and Agri-cultural background.

Today the concept of traditional tourism has been changed. Some new areas of the tourism have been emerged like Agro-Tourism. Promotion of tourism would bring many direct and indirect benefits to the people.

The concept of Agro-tourism is an innovative agricultural activity related to tourism and agriculture both. It has a great capacity to create additional source of income and employment opportunities to the farmers. Maharashtra is one of the major tourist centers in the India and there is large scope and great potential to develop agro-tourism.

### 2. Objectives:-

The objectives of this research paper are follows:

- To study Significance and Opportunities of Agro-Tourism in Maharashtra.
- To examine the importance of agro-tourism for rural development in Maharashtra.
- To define a suitable framework for the of Agro-tourism Centers in the view of marginal and small farmers.
- To identify the problems of the agro-tourism and make suggestions to establishment and operations of agro-tourism for rural development.

### 3. Study Area:-

Maharashtra is one of the major tourist centers in the India and there is large scope and great potential to develop agro-tourism in rural area. The Maharashtra lies in southern part of India. Which is a one of the advance State in the country. Absolute location of state is 17° 57' 8" North Latitude and 75° 16' 00" East Longitudes. Agriculture is a most important occupation in the India including in the Maharashtra. The state has wet worm climate in western part, hot and dry climate in remaining part with an average annual rainfall range from 400 to 6000 mm.

### 4. Scope and Methodology :-

In our Maharashtra the scope of the study is limited to examine the benefits and applicability of agro-tourism business. The study includes their benefits and problems. As well as it includes appropriate framework regarding to establish the agro-tourism centre's

The present research paper is based on secondary data. The data has been furnished from the related articles, research papers, reports and 11<sup>th</sup> plan document of the government of India. Some data has furnished from the websites of the government of India and Maharashtra, as well as ministry

of agriculture. Some ideas have been taken from the Tourism Development Corporation of Maharashtra for this research paper.

### 5. The Concept of Agro-Tourism :-

Agro-tourism is a way of sustainable tourist development and multi-activity in rural areas. A term 'Agro-Tourism' is a new face of tourism. An agro-tourism is farm based business that is open to the public. These specialized agro-tourism destinations generally offer things to see, things to do, and produce or gifts to buy, and are open to the public. Agri-tourism is defined as "Travel that combines agricultural or rural settings with products of agricultural operations—all within a tourism experience".

According to Mr. Pandurang Tavare (ATDC, Pune) - Agro-Tourism is that Agri-Business activity, when a native farmers or person of the area offers tours to their agriculture farm to allow a person to view them growing, harvesting, and processing locally grown foods, such as coconuts, pineapple, sugar cane, corn, or any agriculture produce the person would not encounter in their city or home country. Often the farmers would provide a home-stay opportunity and education". Agro-Tourism and Eco-Tourism are closely related to each other. Eco-Tourism provides by the tour companies but, in the agro-tourism farmers offer tours to their agriculture farm and providing entertainment, education and fun-filled experiences for the urban peoples.

Agro-tourism is a way of sustainable tourist development and multi-activity in rural areas through which the visitor has the opportunity to get aware with agricultural areas, agricultural occupations, local products, traditional food and the daily life of the rural people, as well as the cultural elements and traditions for rural development.

### 6. Basic Requirements for Agro-Tourism Centre's:-

Researcher has identified the minimum requirements for the agro-tourism centre. To develop an agro-tourism in their farm, the farmer / farmers must have basic infrastructure and facilities in their farm as follows:

#### 7.1 Infrastructure for Agro-Tourism Centre's:-

- Accommodation facilities at same place or alliance with nearest hotels.
- Cooking equipments for cooking food, if tourist have interested
- Rich resources in agriculture namely water and plants at the place.
- Farmhouse, which has the rural look and feel comfortable along with all minimum required facilities.
- Emergency medical cares with first aid box.
- Bullock cart, cattle shade, telephone facilities etc
- Goat farm, Emu (Ostrich bird) farm, sericulture farm, green house etc
- The well or lake or swimming tank for fishing, swimming

#### 7.2 Facilities Should Provide Agro-Tourism Centre's:-

- Farmers should offer to see and participate in the agricultural activities.
- Provide information them about the culture, dress, arts, crafts, festivals, rural traditions and also give possible demonstration of some arts.
- Offer authentic rural Indian / Maharashtrian food for breakfast, lunch and dinner.
- Offer bullock cart for riding and horse riding, buffalo ride in the water, fishing facility in your pounds or nearest lake.
- Offer fruits, corns, groundnuts, sugarcane and other agro-products as per availability.
- Must provide safety to tourists' with the support of alliance hospitals.
- Arrange folk dance programme, Shekoti, folk songs, bhajan, kirtana, lezim dance, dhangari gaja, etc.
- Offer an opportunity to participate in the rural games to the tourist

#### 7.3. Location for the Agro-Tourism Centre:-

Location is most important factor for success in the agro-tourism. The location of the centre must easy to arrive and have a good natural background. Urban tourists are interested into enjoying the nature and rural life. So, farmers should develop their centre in the rural areas only which have a beautiful natural background to attract urban tourist in your agro-tourism centre.

Agro-tourism centre must need easy accessible by roads and railways. Tourists want to enjoy some historical and natural tourist places along with the agro-tourism. Hence, the centre should be developed near of these tourist places. It is more beneficial to both tourist and farmers. The places which are already tourist centres like Mahabaleswara, Panchgani, Nashik, Jotiba, Narshinghadi, Pandharpur, Akkalkot, Konkan etc. These are the better places for the development of agro-tourism and also rural development.

### **8. Significance of Agro-Tourism Centre:-**

Agro-tourism is a way of sustainable tourist development and multi-activity in rural areas. The benefits of agro-tourism development are manifold. It would bring many direct and indirect benefits to the farmers and rural people.

- Benefits to the urban peoples, they can understand about the rural life and know about the agricultural activities.
- Employment opportunities to the farmers including farm family members and youth
- Cultural transformation between urban and rural peoples including social moral values
- Farmers can improve their standard of living due to the relation with urban peoples.
- Extra income source for the farmers to protest against income fluctuation.
- Support to the reduce burden on the other traditional tourist centres.
- It support for rural and agricultural development process.

### **9. Agro-Tourism Potential in Maharashtra:-**

Maharashtra is one of the major tourist centers in the India and there is large scope and great potential to develop agro-tourism in rural area. The Potential of Agro-tourism in particular area depends on human skill. Maharashtra is the third largest state of India, both in area and population. It is located on the west coast of India with a 720 km long coastline along the green Konkan region. Nestled in the Western Ghats and the Sahyadri mountain range are several hill stations and water reservoirs with semi-evergreen and deciduous forests.

Maharashtra has a total 22368 thousand hacter area under the agriculture and 36122 thousands of livestock (cow, beffelows, goats etc.). The state has huge areas, under fruit cultivation of which mangoes, bananas, grapes, and oranges etc. Principal crops include rice, Jowar, Bajra, wheat, pulses, turmeric, onions, cotton, sugarcane and several oil seeds including groundnut, sunflower and soyabean.

The state has several communities belonging to different religions, and a number of festivities colours the culture of Maharashtra with the spirit of exuberance. Some of the popular festivals that are celebrated in Maharashtra are Diwali, Ganesh Chaturthi, Gudhi Padwa, Dasara, Nag Panchami, Gokul Ashtmi, Narali Pournima, Pola, Makar Sankranti, Banganga Festival and Holi also. More than 4.11 (43 percent of total) core populations is living the urban areas of the Maharashtra, which will can becomes a customers' of the agro-tourist centre's are located in the rural areas. Other than nature and culture there is an enough road and rail connectivity in urban rural areas to travel in rural Maharashtra.

Maharashtra abounds in numerous tourist attractions ranging from ancient cave temples, unspoiled beaches, ancient forts and monuments, forests and wildlife, unique hill stations, pilgrimage, centre's, and a rich tradition of festivals, art and culture. About 25 more such locations have been identified in Maharashtra as rural agro-tourist destinations. Thus all the districts of Maharashtra have a tourism potential. Some following notable factors are helpful to the agro-tourism

- Maharashtra is already established as one of the top tourist destination in the world
- Good communication and transport facilities
- There are an increasing number of tourists preferring non-urban tourist spots
- Maharashtra has major producer of fruit, spices, medicinal and aromatic plant allowed under horticulture in India.
- Tourist places are already exist to support Agro-Tourism
- Green house cultivation of long stem cut flowers, vegetables, fruits etc.
- Maharashtra has diverse Agro-climatic conditions, diverse crops, people, deserts, mountains, which provide scope for promotion of all season, multi-location agro-tourism

Some of the popular folk dances in rural Maharashtra are Lavni, Dhangari Gaja, Povadas, Koli dance and Tamasha. and Dindi are the religious folk dances. Culture of Maharashtra is very

glorious with a great variety. It gives a unique identity to the rural Maharashtra. All these factors are helpful to the agro-tourism with rural development.

### 10. Supports to the Agro-Tourism in Maharashtra:-

Promotion of Agro-Tourism involves some more important stakeholders namely Ministry of Agriculture and rural development ministry of the state and central governments. To promote domestic tourism, thrust areas identified by the government of India are development of infrastructure, product development and diversification, development of eco-adventure sports, cultural presentations, providing inexpensive accommodation etc.

ATDC (Agriculture Tourism Development Corporation) of Maharashtra has main promoter of this activity in the Maharashtra. ATDC is promoting to agriculture tourism for achieving income, employment and economic stability in rural areas. Help boosting a range of activities, services and amenities, provided by farmers and rural people to attract urban tourists to their area thus providing opportunity to urban people to get back to the rural roots". ATDC is now providing following facilities to the farmers.

- Help facilitate the financial support from Nationalize Banks, Institutes and Government Agencies to built Agri and Rural Tourism facilities and infrastructure like accommodation, sanitation, approach road etc.
- Conduct Agri-tourism Business Training Program.
- Conduct seminars and conferences on agri-tourism business Conduct lectures of the successful National and International Farmers in agri tourism business
- Conduct and coordinate tours from urban areas to the farms.
- Arrange National as well as International Agri Tourism Center study tours.
- ATDC has entertained National as well as International visitors Agri-tourism to promote rural development.

### 11. Problems of the Agro-Tourism in Maharashtra:-

The Maharashtra has a greater potential of the development of the agro-tourism centre's due to the good natural and climatic conditions. But there are some problems in the process of agro-tourism development in the state. Major challenges and problems are,

- Lack of perfect knowledge about the agro-tourism
- Weak communication skill and lack of commercial approach of the small farmers
- Lack of capital to develop basic infrastructure for the agro-tourism
- Ignorance of the farmers regarding to the such type of activities
- Presence of unorganized sector in the Agri-Tourism industry.
- Lack of farmers have small size holding, low quality land and little or no access to credit or irrigation. Have to negotiate with consistent drought.
- 148 of the 355 Talukas in the state are consistently drought prone
- Ensuring hygiene and basic requirements considering urban visitors.

**12. Key Techniques for Success in Agro-Tourism** For the better success in the agro-tourism you should follow the following suggestion:-

- Develop contacts with the schools, colleges, NGOs, clubs, unions, organizations etc.
- Develop website and update time to time for attract foreign tourist
- Develop a good relationship with the tourist for future business and chain publicity
- Preserve address book and comments of the visited tourists for future tourism business
- Small farmers can develop their agro-tourism centre's on the basis of cooperative society.
- Give a wide publicity of your tourism centre by new papers, television, advertisement ect.
- Train your staff or family members for reception and hospitality
- Charge optimum rent and charges for the facilities/services on the commercial base
- Take their feedback and comments about the service and suggestions to more development and modification
- Develop different agro-tour packages of for different type of tourist and their expectations.

### 13. Conclusions:-

Maharashtra has the rich geographical and Agri-cultural background. The Maharashtra has a greater potential of the development of the agro-tourism centre's due to the good natural, climatic conditions and different types of agri-products as well as variety of rural traditions, festivals. More than 45 percent of population is live in the urban areas and they want enjoy rural life and to know about the rural life. It is a good opportunity to develop an agro-tourism business for rural development in Maharashtra. But there is a problem of low awareness about this business in the farmer and problem of the finance and proper view in the farmers of the Maharashtra.

Shortly, the agriculture departments of the districts', Agriculture Universities should try to give orientation and training about it and provide some innovative ideas regarding to the Agro-Tourism. The government should try to provide optimum financial aids to the agro-tourism activities in the Maharashtra by the grants and institutional finance. Bank should provide optimum financial help for the agro-tourism activities in the Maharashtra. Union of the agro-tourism service providers is also another need of these farmers which helps to the agricultural tourism network in Maharashtra. All these good way are helpful to the agro-tourism for rural development.

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## Rural Background and Origin of Banjara Community

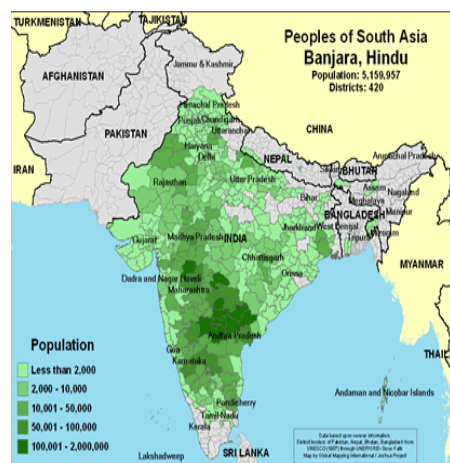
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### Introduction

The Indian Caste System has unique features among the systems of social stratification. So, cast system is very important in Indian society. About the caste system anthropologist Ghurye said that, "A cast was a group with a separate arrangement for meeting out justice to its members apart from that of the community as a whole, within which the caste was included as only one of the group. This means that, in this caste bound society the amount of community feeling must have been restricted and that the citizens owed moral allegiance to their caste first, rather than to the community as a whole."<sup>1</sup> Nomads group is the part of these cast system in Indian society. According to The Royal Anthropological Institute of Great Britain and Ireland in their work 'Notes and Queries on Anthropology' describe nomads as "those dependants principally on hunting or collecting for their food supplies, having no permanent abodes." The Encyclopaedia of Social Sciences defines nomadism as "involving the repeated shifting for subsistence and undirected wandering, but is focused around temporary centres of operation, stability of which depended upon food supply and the state of technical advance. It assumes different forms, according to methods of obtaining food, topographic and climatic conditions." The word 'Nomad' is derived from Greek word 'Nomo' meant one who rear cattle. In European countries due to lack of dense forests and availability of wide pasture lands most of the communities undertook cattle rearing business for a considerable period. The word 'nomo' came to be used in contemporary society. The word 'nomad' is derived form of 'nomo' and hence in Indian context we perceived its resemblance to the Marathi word 'Bhatake'. In Indian context three communal groups are observed to have occupied with livestock business, hunters and food gatherers in all stages of Indian civilization. Hence, in India instead of identifying only livestock owners as nomads all of the three communal groups are collectively termed as nomads.<sup>2</sup>

The De-notified and Nomadic Tribes comprise 14 De-notified i.e. criminal tribes and 28 nomadic tribes. The De-notified tribes include Berad, Bestar, Kaikadi, Kanjarbhat, Katabu, Banjara (Lamani), Pathrut (Takari), Paradhi, Rajput Bhamta, Ramoshi, Wadar, Waghari and Chhapparband etc. Whereas the Nomadic tribes primarily termed in the name of Gosavi, Beldar, Bharadi, Bhute, Chitrakathi, Garudi, Chisadi, Golla, Gondhali, Helave, Joshi, Kashikapadi, Kolhati, Mairal, Masanjogi, Nandiwale, Pangul, Raval, Shikkalkari, Thakar, Vaidu, Vasudev, Bhoi, Bahurupi, Thelari and Otari. Despite these numerous castes, there are near about 150-175 sub-castes. Thus, a sum total of 215 castes are bunched together in De-notified and Notified tribes.<sup>3</sup>



The Banjara is an Indian tribe generally found living in the states of Rajasthan, Madhya Pradesh, Uttar Pradesh, Maharashtra, Andhra Pradesh, Telangana and northern Karnataka and all over the India. The language spoken by

the Banjara resembles to be originated from Rajasthan. The Banjara lead a gypsy life. In the earlier ages they lived as nomads and led most of their life travelling across the Indian subcontinent covering wet, arid and forests but migrated from place to place. When there were few or no roads they carried grain and salt on oxen, as also bamboos and firewood on their own heads. The Banjara people were formerly considered as suppliers of grain to armies. Like many other countries during this period, Mughal India had neither metalled roads nor advanced means of transport's. Studying the history of such Banjara tribe will be very encouraging.

### Origin of word 'Banjara'

Halbar B.G. said about Banjara word. He said Lambani's are traditionally known as suppliers and pack bullock carriers and Banjara word is derived from Sanskrit word *vanachara* (wanderers in jungle). The word Lambani or Lamani is derived from Sanskrit word *lavana* (salt) which was the principal goods they transported across the country.<sup>5</sup> Prof.Motiraj Rathod is said about the word of

Banjara, "The word banjara is derived from the Hindi word 'Banaj' and Banaj means trade. So, who's doing banaj he was banjara.

The Banjara, also called Lamani, Lambani, Banjara Lambani are a class of people usually described as nomadic people from the Indian state of Rajasthan, now spread out all over India. Banjara claim to be descended from Rajput's, and are also known as Lakha Banjara means *Lakhapati, Banjari, Pindari, Bangala, Banjori, Banjuri, Brinjari, Lamani, Lamadi, Lambani, Labhani, Lambara, Lavani, Lemadi, Lumadale, Labhani Muka, Goola, Gurmarti, dhadi, Gormati, Kora, Sugali, Sukali, Tanda, Vanjari, Vanzara, and Wanji*. Together with the Domba, Domaki, Dombo, Domra, Domaka, Dombar, Dombari and variants are an ethnic or social group, or groups, scattered across India, they are sometimes called the 'gypsies of India'.<sup>5</sup> They are known for coloured dress, folk ornaments and bangles.



### Historical Background

Banjara is one of the historical community. According to some historians the history of Banjara is very critical and ambiguous. Banjara claims that they are Rajput's origin. They also claim that they are from warrior race and helped the Maharana Pratap against Mughals. Still it is important to think about the existence of Banjara community. The description of the historicity of Banjara tribe is as follows:

Syed Siraj - Ul - Hassan in his book *Castes and tribes of the Nizams Dominions*, clearly describes Banjaras. He said about the origin of Banjara, The Banjaras claim to be descended from Mota and Mola, the two brothers who tended Sri Krishna's cows. From Mota sprang the ancestors of the modern Marwaris, Mathura Banjaras and Labhanas. Mola, having no issue, once visited a prince's court, with his wife Radha, and there exhibited gymnastic feats, in which he was an adept. The prince was so pleased with Mola's skill and so charmed with Radha's beauty and grace, that he gave them, as reward, three infant boys of different castes, whom they adopted as sons. In course of time the boys grew up and were married. Their progeny has been collectively known as Charan Banjaras.<sup>6</sup> Syed Siraj- Ul-Hassan is also said, this account, ascribing to the Banjaras a mixed parentage, appears to have been founded on fact. There can be no doubt that these people, so varied in their characteristics, were recruited from different races of Northern India' and bound together by ties of common occupation.<sup>7</sup>



The history of Banjara says that they had been carriers of supplies and drivers of pack-bullocks. There are a number of historical evidences and landmark which prove that the Banjara tribe is one of the aboriginal and primitive tribes of Indian sub-continent. The 'Lamani Margas' dating back to 6<sup>th</sup> century B.C., proves that this tribe lived even before the period of Buddha.<sup>8</sup> The Banjara tribe seems to be the most ancient, since their migrations go as far back as the 6th century B.C., their extensive migrations took them sometimes outside the frontiers of Rajasthan. These migrations if they are judged by the inscriptions found in Khyber and Bolan passes, had taken place between 600 B.C. and 350 B.C.<sup>9</sup> Perhaps, the Banjara stopped their migrations towards West during decline of Buddhism around 12<sup>th</sup> Century A.D., before Moghul invasion. According to report of 'All India Banjara Sewa Sangh', Though Banjaras are spread throughout the country, they gradually became sedentary over a period of 150 to 200 years, as the British Traders and Rulers introduced railways and automobiles for



transportation of merchandised. So, Banjaras started settling down permanently in many states of the country, little by little, after world war 2, and the major population of Banjaras settled down after independence of India.

#### List of Eighteen Sub Cast of Banjara

- |                               |                              |                                |
|-------------------------------|------------------------------|--------------------------------|
| 1. Charan or Charan Banjara   | 7. Singadya Banjara          | 14. Rohidas or Ravidas Banjara |
| 2. Mathura or Mathura Banjara | 8. Marru Banjara             | 15. Dhankuta Banjara           |
| 3. Dhadi Banjara              | 9. Bamanya Banjara           | 16. Bhat Banjara               |
| 4. Sanar Banjara              | 10. Bagora Banjara           | 17. Jogi or Bharva Banjara     |
| 5. Navi Banjara               | 11. Digora or Gigora Banjara | 18. Sikh Banjara               |
| 6. Dhalia Banjara             | 12. Badi Banjara             |                                |
|                               | 13. Bajigar Banjara          |                                |

#### Conclusion

Banjaras are a nomadic community of people, who are found in the north-western belt of the Indian subcontinent, from Afghanistan to the state of Rajasthan. They are also variously called as Gor, Lambani, Vanjara and Gormati. Anthropologists have said the banjaras have origins in Afghanistan. The word Banjara is said to have originated in Sanskrit and means wanderers in junglelike. vanachara. Banjara art revolves around Rangoli, textile embroidery, tattooing and painting. Their dance and music are also unique and have been acclaimed. Although widely dispersed today, banjaras are primarily found in the states of Rajasthan, Karnataka, Andhra Pradesh, Maharashtra and Telengana.

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## Agro Tourism For Sustainable Development Of Rural Maharashtra

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### Abstract:

*Agro tourism, also commonly referred to as Agri tourism or Agricultural Tourism, is a form of tourism, whereby people travel for watching, practicing, participating and experiencing agricultural activities for recreational purposes. Last few decades Agro tourism has gaining worldwide attention.*

*After independence urban population is increasing significantly. Urban population with spare time and little rural background inclining towards Agro Tourism. Growth of Agro Tourism is beneficial for rural areas sustainability.*

*In the present research paper an attempt has been made to study role of Agro Tourism in Sustainable development of rural Maharashtra especially agricultural sector.*

*For the current study also attempt made to study concept, scope and importance of Agro Tourism.*

**Key Words:** Agro Tourism, Farms, Sustainable Development, Urban etc.

### Introduction:

Tourism activity has been divided in various separate specialized segments. Which ranges from historical to adventure sport, from cultural visits to nightlife etc. among them Agro tourism is very significant and widely gaining recognition round the world.

Tourism is a service industry which is very beneficial for growth and development of any region in the world. Modern tourism is closely linked to development and encompasses a growing number of new destination. These dynamics have turned tourism into a key driver for socio-economic progress.<sup>1</sup>

The rural part of Maharashtra has population 61,556,074 which is 54.8% <sup>2</sup>of total population. This huge population is primarily engaged in agriculture and other allied activities. Though Maharashtra is considered as one of the developed state in India but has own problems especially rural problems like unemployment, poverty, indebtedness, rural-urban migration, power supply etc. Majority of these problems are associated with farmers

On Independence Day speech of August 15, 2017 The Prime Minister of India, Shri Narendra Modi announced map to double the agriculture income in next 5 years. There are strategies to achieve this agrotourism is also beneficial.

### Study Area:

For the current study Maharashtra state has been selected having total area of 307,713 km<sup>2</sup> Its geographical extent is 15<sup>08</sup>' N to 22<sup>01</sup>' N Latitude and 72<sup>06</sup>' E to 80<sup>09</sup>' E longitude. In Maharashtra rural population is 61,556,074 which is 54.8% of total population of 112,374,333

### Objectives:

In the present research paper an attempt has been made to study the usefulness of agrotourism in sustainable development of rural Maharashtra. Also there are some other objectives also they are as follow:

- 1) To understand concept of agrotourism.
- 2) Growth of agrotourism in Maharashtra.

### Database And Methodology:

For the present study the primary data collected through questionnaire. Methods of observation, discussions with experts were also employed. Secondary data was collected from books, journals, news papers, internet etc.

### Findings:

#### Agro Tourism:

Agrotourism is evolved from rural tourism also closely related to sustainable tourism. In industrially developed countries this type of activities started but recently in south Asian countries agrotourism is gaining attention though these countries are agro based countries. Every year **World Agri-Tourism Day is celebrated on 16 May by AGRI TOURISM DEVELOPMENT CORPORATION**



Sustainable tourism development meets the needs of tourists and host regions, protecting and expanding the possibilities for the future. Tourism can bring both advantages and disadvantages in the area. It can stimulate the development of other economic activities such as agriculture, local production of food and crafts, and help increase revenue.<sup>3</sup>

Agritourism or agrotourism, as it is defined most broadly, involves any agriculturally based operation or activity that brings visitors to a farmor ranch.<sup>4</sup>

Agro-tourism is a way of sustainable tourist development and multi-activity in rural areas through which the visitor has the opportunity to get aware with agricultural areas, agricultural occupations, local products, traditional food and the daily life of the rural people, as well as the cultural elements and traditions. Moreover, this activity brings visitors closer to nature and rural activities in which they can participate, be entertained and feel the pleasure of touring.<sup>5</sup>

Generally in agro tourism people from urban areas visits to the places having agricultural fields. The agricultural activities in agro tourism are numerous they differ from place to place and time to time. Some important activities are Plowing, sowing seeds, animal or cart rides, milking the animals, agro markets, plucking flowers or fruits, wine making etc. They participate in this tourism actively or passively i.e. they take part in agricultural activities or just watch these activities while happening.

In Maharashtra agro tourism is quite new concept. In year 2005 AGRI TOURISM DEVELOPMENT CORPORATION (ATDC) was started. Which owns the Agri tourism project of 28 acres in Palshiwadi, talBaramatiDist Pune, 70 km away from Pune city. This is a pioneer and lighthouse for other agro tourism centers. In 2007, ATDC launched Training and skills development programs with Maharashtra State Agri Tourism Vistar Yojana,<sup>6</sup> according to ATDC there are 328 Agri tourism centers across 30 Districts in Maharashtra,<sup>7</sup> ATDC selects farms on some criteria's and train them for agro tourism activities also MAHARASHTRA KRISHI PARYATAN VISTAR YOJANA were implemented by MAHARASHTRA STATEAGRI &RURALTURISM CO-OPERATIVEFEDERATIONLTD- MART in year 2010, 2012

The ATDC survey in 2014 , 2015 , 2016 shows that 0.40 million, 0.53million ,0.7 million tourists have visited these centers respectively totally generating 35.79 million Indian rupees to farmer's family, generated jobs to women and youth in the rural communities.<sup>8</sup>

### **Benefits Of Agro Tourism:**

Agro Tourism is very beneficial for farmers, rural areas, tourism industry and tourists also. However the benefits of agro tourism for rural Maharashtra are as follows:

#### **Farmers:**

1. Agricultural market will expand and farmers can sell their produce direct to consumers.
2. With the use of agrotourism farmers can have more income which will make agriculture more profitable.
3. Farmer's standard of live will increase;they can manage agricultural activities more efficiently.
4. Along with tourism activities other subsidiary agricultural activities will increase like dairy, animal husbandry etc. because they also prove to be attractions of tourists.

#### **Rural areas:**

1. Rural areas may get extra revenues as local businesses and local servicemen also get benefits from agrotourism.
2. Infrastructural facilities in rural areas may increase.
3. Conservation of natural resources, traditions and culture will increase as they are the major sources of attractions.
4. Sustainability in rural areas will be increased in terms.
5. Migration from rural areas to urban areas will decrease as employability in rural areas will increase.
6. Interaction between rural and urban areas will increase understanding of problems and awareness.

#### **Tourists:**

1. Urban people can understand rural life, rural culture, economy and agricultural activities easily with the help of agrotourism.



2. They can support rural economy and areas with their activities.
3. Agrotourism will help tourist to understand nature without crowd because most of the other tourist places are crowded.
4. They can actually participate in agrotourism activities.

#### **Limitations In Development Of Agro Tourism In Maharashtra:**

1. Still this tourism is new to Maharashtra and farmers, tourists as well as tourist agencies are not fully aware of the concept.
2. Exact requirements to built and run agrotourism centre are ambiguous in Maharashtra.
3. There is confusion in tourist also because they are also not fully aware about the rural areas and geographical limitations in area.
4. Most of the rural areas have less transportation facilities so it became hurdle in development of agrotourism.
5. Some rural areas have water scarcity and problems of power cuts it is also a major issue in development of agrotourism.
6. For single farmer or for few it is not possible to built infrastructure and advertisement of center.
7. Financial support from institutions is very less due to limited development.

#### **Conclusion:**

From the above study it reveals that there is lot of scope for the development of agro tourism in Maharashtra as day by day urbanization is increasing. This urban population is less aware about agricultural activities. So with the help of agro tourism economical upliftment of farmers can happen. Urban population can enjoy rural and agricultural environment. In near future trend of agro tourism will go further.

#### **Suggestion:** Following are some suggestions based on the study.

1. Still this concept is in initial stages government and other agencies must encourage farmers for agro tourism.
2. For awareness about agro tourism concept more advertisement campaigns should be arranged.
3. Training for farmers must be increased by the agencies like AGRI TOURISM DEVELOPMENT CORPORATION
4. Continuous training and support should be provided to the agro tourism centers.
5. To help the farmers for getting financial support from financial institution to develop and upgrade the tourism activities.
6. Accessibility in rural areas must be increased to increase flow of tourists in remote and rural areas.
7. Branding of agricultural, traditional, handicraft and local products must be taken in hand by the agencies like Khadi Gramodyog
8. Reservation, tour planning, information system, guidance to tourists should be given under an one umbrella center for better coordination, smooth functioning and uniformity

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## USE of R for Statistical Analysis in Geography

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### Abstract

*Geography is a spatial science. For spatial analysis we need various tools and statistical techniques. For using these methods various Statistical and GIS software's are being used. Among Geographers various statistical packages are famous SPSS, Python, Stata, SAS, MATLAB, R etc. are some of them*

*In current paper an attempt has been made to study the concept, background, various methods in R and its benefits for Statistical analysis in Geography.*

*R is a open source programming language used for statistical analysis. R was developed by Ross Ihaka and Robert Gentleman, both from the University of Auckland. Now Core team looks in to development of R.*

*R is a freely available programming language which is used to perform various statistical operations as per the requirements of researchers irrespective of amount of data. R is gaining popularity in recent times among not only Geographers but also others social science researchers.*

### Introduction:

Geography is a spatial science. For spatial analysis we need various tools and statistical techniques. "The study of geographic phenomena often requires the application of statistical methods to produce new insight."<sup>1</sup> For using these methods various Statistical and GIS software's are being used. Among Geographers various statistical packages are famous SPSS, Python, Stata, SAS, MATLAB, R etc. are some of them. R is gaining popularity in recent times among not only Geographers but also others social science researchers.

### Objectives:

In current paper an attempt has been made to analyse use of R for Statistical analysis in Geography. However specific objectives are as under:

1. To study background of R
2. To study concept of R
3. To study various statistical methods integrated in R
4. To study benefits of R.

### Database & Methodology:

For the current study of Use of R for Statistical Analysis in Geography, The primary data is collected through the execution of R software and Secondary data is collected from books, journals manuals of R, websites etc.

### Discussion:

#### Background:

R is a open source programming language used for statistical analysis. "The initial version of R was developed by Ross Ihaka and Robert Gentleman, both from the University of Auckland. Development of R is now overseen by a 'core team' of about a dozen people, widely drawn from different institutions worldwide. Like Linux, R is an "open source" system. Source-code is available for inspection, or for adaptation to other systems. Exposing code to the critical scrutiny of highly expert users has proved an extremely effective way to identify bugs and other inadequacies, and to elicit ideas for enhancement. Reported bugs are commonly fixed in the next minor-minor release, which will usually appear within a matter of weeks."<sup>2</sup>

#### Concept:

R is a freely available programming language which is used to perform various statistical operations as per the requirements of researchers irrespective of amount of data. R can be used over almost all types of operating systems hassle free. Sometimes called as R Environment "R is a system for statistical computation and graphics. It provides, among other things, a programming language,

high level graphics, interfaces to other languages and debugging facilities..... The R language is a dialect of S which was designed in the 1980s and has been in widespread use in the statistical community since. Its principal designer, John M. Chambers, was awarded the 1998 ACM Software Systems Award for S.”<sup>3</sup>

R language is similar to C language where we have to write the codes in proper syntax. R has some preinstalled formulas or we have to install from CRAN. “CRAN is a network of WWW sites holding the R distributions and contributed code, especially R packages. Users of R are encouraged to join in the collaborative project and to submit their own packages to CRAN”<sup>4</sup> User can also create formulas or functions on his own.

“R is an integrated suite of software facilities for data manipulation, calculation and graphical display. Among other things it has

- \_ an effective data handling and storage facility,
- \_ a suite of operators for calculations on arrays, in particular matrices,
- \_ a large, coherent, integrated collection of intermediate tools for data analysis,
- \_ graphical facilities for data analysis and display either directly at the computer or on hardcopy, and
- \_ a well developed, simple and effective programming language (called ‘S’) which includes conditionals, loops, user defined recursive functions and input and output facilities. (Indeed most of the system supplied functions are themselves written in the S language.)”<sup>5</sup>

The data processed in R can be of any type like variables, arrays of numbers, character strings, functions, or more structures. R gives user flexibility to enter his data either manually or from external files in various simple but strict formats. “Around 100 datasets are supplied with R (in package datasets), and others are available in packages (including the recommended packages supplied with R).....All the datasets supplied with R are available directly by name. However, many packages still use the obsolete convention in which data was also used to load datasets into R”<sup>6</sup>

The results known as functions of R can be stored in internally in specific format and can be retrieved for further investigation. R gives user exceptional graphical facilities which separates R from rest of the applications. “Graphical facilities are an important and extremely versatile component of the R environment. It is possible to use the facilities to display a wide variety of statistical graphs and also to build entirely new types of graph.”<sup>7</sup>

“All R functions and datasets are stored in packages. Only when a package is loaded are its contents available. ....The standard (or base) packages are considered part of the R source code. They contain the basic functions that allow R to work.”<sup>8</sup>

### Statistical Methods Integrated In R:

As R is a statistical package it must have various statistical tools and techniques. But when we compare the R with other statistical packages can understand the wide verity of tools and techniques. Despite the packages are open source or licensed various packages miss various tools and techniques which are present in R. Following discussion will give us the information about the wide verity of tools and techniques in R compared to other packages.

“Currently 63 statistical packages are available for statistical analysis.”<sup>9</sup> Out of these 43 packages are paid while 19 packages are open source R is one of them. Only R and Statcrunch run on all operating system but later is paid package. Facility of Calculation of ANOVA by 7 methods available only 7 packages, but 6 packages are paid only open source package is R.

Computation of Regression by 13 methods is available in 8 paid packages while R is stand alone open source package capable for this. For Time Series analysis 6 methods are available in 5 paid and 2 open source packages R is among these 2 open source package. Along with 31 other paid and open source packages R Support for various statistical charts and diagrams.

Descriptive statistics (Base stat, Normality tests), Nonparametric statistics (CTA, Nonparametric comparison, ANOVA), Quality control, Survival analysis, Cluster analysis, Discriminant analysis, Data processing (BDP, Ext), etc. facilities are present in 14 packages R is one of them. So we can conclude that R is being an open source package but still having maximum number of statistical tools than other paid and open source packages.

### Benefits Of R:

Use of R gives us various benefits over other packages. “The “user-contributed software” is one of the most unique and beneficial aspects of R, as a large number of users have contributed code

for implementing some of the most up-to-date statistical methods, in addition to R implementing essentially all standard statistical analyses.”<sup>10</sup> Following are some of the benefits of R

1. It is free of cost and can run on any operating system.
2. R language is very powerful, syntax of R is easy to understand and it has various built-in statistical functions.
3. Manipulation of data is very easy in R. either calculations are simple or manifold R gives immediate results. Moreover new techniques are introduced frequently.
4. For graphical representation of data R gives us very powerful and wide range of graphics which has very high analytical powers
5. As R is open source so various peoples are working on its development so new features and abilities added frequently.
6. If any user cannot deal with programming language in R he can use R Commander which is point and click interface.
7. R can work on small amount data as well as large amount of data efficiently.
8. For hypothesis testing, multiple regression, ANOVA, Time series analysis etc. R has various techniques.
9. R gives us facility to write our own functions.
10. Graph generated in R can be retrieved in various formats (JPG, JPEG, TIFF, BMP etc.)
11. Can be used for Spatial analysis with the help of various packages (like spdep, maptools, shape files, rgdal, spatial etc. )
12. Raster data can be worked out in R.
13. Vector data, layers can be created modified through R.
14. Raster and vector data can be integrated through R.
15. Results generated in R can be generated in various extensions.
16. R has built-in help system.

### **Inference:**

Above discussion gives us a clear indication that R is very powerful Language useful for statistical analysis in social sciences. R is freely available and in process of continuous development. More and more techniques datasets functions are added in it. So R is growing popular among the social science researchers. Benefits of R are manifold. Beside quantitative data qualitative data can be processed in R. Raster and Vector data which is useful for Geographers can be processed in R also with precision.

We can expect more and more use of R in Geographical analysis in near future.

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**Production Trend Of Major Crops, Fisheries And Livestocks In India: An Analytical Study****Author:****Dr. Sagar S. Kondekar**E-mail: [sskondekar@gmail.com](mailto:sskondekar@gmail.com)**Co-author:****Mr. Kiran L. Shinde**E-mail: [kshinde206@gmail.com](mailto:kshinde206@gmail.com)**Abstract:**

India stands at seventh position with 329 million hectares of areal territory and stands at second position with 1295 million populations in the world (Census. 2011, NITI Ayog). Domestic demand for food grain and other agricultural product (non-agricultural products also) is very high in India. Majority of the Indian population is engaged in agriculture sector than industrial or service sector. With all prominent positions in the world agricultural production, it is very appropriate to review and understand the trend of different agricultural products within India. This paper is an attempt in this direction to study and review the trend of different major agricultural products including major crops, fisheries and livestock products. Hypothesis for the present study is: 'there isn't any significant difference in the production trend of the major crops, fisheries and livestock products.' This macro level study is analytical in nature and attempt to explore the nature of the trend of different agricultural products in India. Study has utilised time series data to reach to appropriate outcomes of the study. Data for present study is collected through authentic secondary sources only.

**Keywords:** Agricultural Products, Major Crops, Livestock products, Fisheries**Introduction:**

India stands at seventh position with 329 million hectares of areal territory and stands at second position with 1295 million populations in the world (Census. 2011, NITI Ayog). Domestic demand for food grain and other agricultural product (non-agricultural products also) is very high in India. Majority of the Indian population is engaged in agriculture sector than industrial or service sector. India stands at first position in the world production of Milk and total Pulses. India stands second in the world production of oilseeds, sugarcane, cotton, wheat and rice. India produces 10 percent of the total cereals of the total world cereals and stands at third position after China and USA. (Agricultural Statistics: At A Glance 2016) With all prominent positions in the world agricultural production, it is very appropriate to review and understand the trend of different agricultural products, fisheries and livestock products within India.

**Objectives and hypothesis of the paper:**

The objective of the present research is to study and review the trend of different major agricultural products including major crops, fisheries and livestock products. Hypothesis for the present study is: 'there isn't any significant difference in the production trend of the major crops, fisheries and livestock products.'

**Methodology:**

This macro level study is analytical in nature and attempt to explore the nature of the trend of different agricultural products in India. Present research paper analyses the production trend of Rice, Wheat, Sugarcane, Cotton, Fish, Milk and Eggs in India during 1985 to 2016. Reason behind choosing only these products are that the India stands among the dominant countries in the production of these products only. Study utilised time series data from 1985 to 2016. 1985 is the year when first economic reforms were introduced in India and 2016 is the year at which the latest data on agriculture production is available. Data for present study is collected from authentic secondary sources like Department of Animal Husbandry Dairying and Fisheries, Directorate of Economics and Statistics, Central Statistics Office, Ministry of Agriculture and Farmers Welfare etc. In the present research many statistical methods are used to interpret the results of the study. Objective of using these statistical techniques was to interpret the results in more meaningful manner.

**Production Trend in Major Crops, Fisheries and Livestock Product:**

As shown in table 1.1, production trend of rice and wheat looks symmetrical since 1985. Correlation between both found to be 0.952 and highly significant at 0.01 levels. It reflects that both are symmetrically changed over the time of period. It was a period between year 1999 to 2005 when the actual rainfall was less than the normal rainfall so that the production of wheat and rice both



shown declining trend during the period. Production of rice is always at high than the production of wheat. The gap between the production of rice and wheat was more up to year 2008-09 but it was much narrowed down after 2009-10. Further at the end of the data, wheat production seems increasing and rice production seems falling. The production of cotton was less than 15 million bales up to 2004-05. But after 2004-05 it was increasing very rapidly. Except year 2008-09, the production of cotton is rapidly increasing than any other crop.

**Table1.1: All India Production of Major Crops, Fisheries and Livestock Product**  
 (Cotton in million bales; Eggs in Billion no's; Fish '000 tonnes & all others in million tonnes)

Year	Rice	Wheat	Sugarcane	Cotton	Milk	Eggs	Fish
1985-86	63.83	47.05	170.65	8.73	44	16.1	2876
1986-87	60.56	44.32	186.09	6.91	46.1	17.3	2942
1987-88	56.86	46.17	196.74	6.38	46.7	17.8	2959
1988-89	70.49	54.11	203.04	8.74	48.4	18.9	3152
1989-90	73.57	49.85	225.57	11.42	51.4	20.2	3677
1990-91	74.29	55.14	241.05	9.84	53.9	21.1	3836
1991-92	74.68	55.69	254	9.71	55.7	21.9	4157
1992-93	72.86	57.21	228.03	11.4	58	22.9	4365
1993-94	80.3	59.84	229.66	10.74	60.6	24.2	4644
1994-95	81.81	65.77	275.54	11.89	63.8	25.9	4789
1995-96	86.98	62.1	281.1	12.86	66.2	27.2	4949
1996-97	81.73	69.35	277.56	14.23	69.1	27.5	5348
1997-98	82.54	66.35	279.54	10.85	72.1	28.7	5388
1998-99	86.08	71.29	288.72	12.29	75.4	29.5	5298
1999-00	89.68	76.37	299.32	11.53	78.3	30.4	5675
2000-01	84.98	69.35	295.96	9.52	80.6	36.6	5656
2001-02	93.34	72.77	297.21	10	84.4	38.7	5956
2002-03	71.82	65.76	287.38	8.62	86.2	39.8	6200
2003-04	88.53	72.16	233.86	13.73	88.1	40.4	6399
2004-05	83.13	68.64	237.09	16.43	92.5	45.2	6305
2005-06	91.79	69.35	281.17	18.5	97.1	46.2	6572
2006-07	93.36	75.81	355.52	22.63	102.6	50.7	6869
2007-08	96.69	78.57	348.19	25.88	107.9	53.6	7127
2008-09	99.18	80.68	285.03	22.28	112.2	55.6	7616
2009-10	89.09	80.8	292.3	24.02	116.4	60.3	7998
2010-11	95.98	86.87	342.38	33	121.8	63	8231
2011-12	105.3	94.88	361.04	35.2	127.9	66.5	8666
2012-13	105.2	93.51	341.2	34.22	132.4	69.7	9040
2013-14	106.7	95.85	352.14	35.9	137.7	74.8	9572
2014-15	105.5	86.53	362.33	34.8	146.3	78.5	10164
2015-16	104.3	93.5	352.16	30.15	155.5	82.9	10796

*Sources: Directorate of Economics & Statistics, DAC&FW, Department of Animal Husbandry Dairying & Fisheries*

India stands at second position in the production of sugarcane in world next to Brazil. Commercial crop sugarcane also shown increasing trend in last three decades. The production of sugarcane was 170.65 million tonnes in 1985-86 which doubled to 352.16 million tonnes in 2015-16. The main reason behind such an enormous increase in production was the rise of cooperative sector in sugarcane industry and the policy support given by the Central and the State government both. The

growth of production of sugarcane is not linear which is evident from the figure and statistical data also. The period, 2000-01 to 2003-2004 recorded a decline in the sugarcane production whereas the subsequent period of 2003-04 to 2006-07 recorded highest growth rate. Again there was fall in the period 2006-07 to 2009-10 and increase in the subsequent years. This trend is due to uneven monsoon in the period. The production of sugarcane is mainly dependent on the availability of water in the region. By its biological features sugarcane is known as a grass than the crop. It is always high in production than any other crop/grass production in India.

India stands at first position (as per 2014 data) in the production of milk contributing 18.3% of the world production (Directorate of Economics and Statistics. 2014). Due to white revolution in India the production of milk has increased to almost four times during the period under consideration. Global brands like Amul are developed in India by Indian farmers themselves. The production of milk provides additional income to the farmer which promotes them to increase its production. India stands at third position (as per 2014 data) in the production of eggs after China and USA. There isn't any major business cycle structure in the trend of production of Milk, Eggs and Fisheries. It only exists in the production of rice, wheat, sugarcane and cotton. The major reason for the linear production trend of Milk, Eggs and Fish is that, all these products are not dependent on monsoon but on non-monsoon and other factors.

As shown in the table 1.2, mean production of rice (85.52) is much higher than the mean production of wheat (69.86). Standard deviation for the wheat production is marginally high than the rice production. Production trend of wheat is showing rapid rise in recent times. It may be the reason that the dispersion value for wheat (std. Dev. 14.78 and range 52) is more than the dispersion value of rice production (std. Dev. 13.59 and range 50), that too when, the mean production of wheat is less than the mean production of rice.

**Table 1.2: Statistics on the Production**

Statistics on Production							
( Cotton in million bales; Eggs in Billion no's; Fish '000 tonnes & all others in million tonnes)							
Statistics/Product	Rice	Wheat	Sugarcane	Cotton	Milk	Fish	Eggs
No of Years	31	31	31	31	31	31	31
Mean	85.52	69.86	279.405484	17.17	86.43	6039.42	40.39
Median	86.08	69.35	281.170000	12.29	80.60	5675.00	36.60
Std. Deviation	13.599	14.789	55.0721401	9.668	32.309	2176.948	20.140
Skewness	-.228	.105	-.130	.907	.544	.463	.662
Std. Error of Skewness	.421	.421	.421	.421	.421	.421	.421
Range	50	52	191.6800	30	112	7920	67
Minimum	57	44	170.6500	6	44	2876	16
Maximum	107	96	362.3300	36	156	10796	83

*Source: Data collected from Directorate of Economics & Statistics, DAC&FW, Department of Animal Husbandry Dairying & Fisheries and processed through SPSS.*

Highest dispersion belongs to the fish production than the dispersion of any other crop or livestock products. Fish production was averagely 5000 ('000 tonnes) or less up to 2000-01. But since last 15-16 years, the fish production rose at the average rate of more than 8000 ('000 tonnes). The reason behind it was the promotion and rapid growth of inland fisheries in India. Contribution of marine fisheries to the total fish production is now marginal whereas the contribution by inland fisheries is very significant. As shown in table 1.2, except rice and sugarcane, skewness values of all other products are positive.

**Area Under Production and Area Under Irrigation for Different Crops:**

As shown in table 1.3, area under production for rice was much more than any other agricultural production in last 31 years. Mean area under production for rice is 43 million hectares whereas for wheat it is 26.53 hectares, for cotton it is 9 million hectares and for sugarcane it is much less i.e. only 4.15 million hectares. But mean area under irrigation for sugarcane is 90 percent

followed by area under irrigation for wheat is 46 percent. Area under irrigation for rice is only 52 percent to the total area under production. It is very interesting to observe the range values for area under irrigation data. Range found to be highest for the area under irrigation of wheat. The difference between minimum and maximum values for the wheat are highest than any other agricultural production. After the green revolution the area under irrigation for wheat has increased very significantly.

**Table 1.3: Statistics for Area Under Production and Area Under Irrigation**  
 (Area under production is in million hectares and area under irrigation is in percentage of area under production)

		Area Under Production				Area Under Irrigation			
Statistics/Prod.		Rice	Wheat	Cotton	Sugarcane	Rice	Wheat	Cotton	Sugarcane
N	Valid	31	31	31	31	29	29	29	29
	Missing	0	0	0	0	2	2	2	2
Mean		42.99	26.53	9.01	4.15	52.44	86.46	34.19	90.46
Median		42.84	26.38	8.79	4.17	53.50	87.20	34.30	91.30
Std. Deviation		1.431	2.406	1.726	.652	5.283	5.310	2.265	3.256
Skewness		-.571	.292	.814	-.056	-.369	-.673	-1.056	-.239
Std. Error of Skewness		.421	.421	.421	.421	.434	.434	.434	.434
Range		7	8	6	2	17	19	11	11
Minimum		39	23	6	3	43	75	27	84
Maximum		46	31	13	5	60	94	38	95

*Source: Data collected from Directorate of Economics & Statistics, DAC&FW and processed through SPSS*

Area under production is highest for rice than wheat and sugarcane but the area under irrigation is highest for sugarcane than wheat and rice. India ranks second (for 2014) in the world production of rice (China stands first), wheat (China stands first) and sugarcane (Brazil stands first). Though the world ranking is same for all the products but the area under different productions and area under irrigation for different agricultural productions varies within India.

**Correlation between Production, Area Under Production and Area Under Irrigation:**

As shown in table 1.4, correlation between area under production and actual production for sugarcane found to be 0.980 which is high positive correlation than the correlation of any other agricultural productions. For the rice, correlation is only 0.731. The production of rice is not proportionate to the area under production though the area under production for rice is higher than any other agricultural production. If we look at the correlation between area under irrigation and area under production, wheat found to be with high positive correlation (0.930) followed by rice (0.926).

**Table 1.4: Correlation between the Production, Area under Production and Area under the Irrigation of Major Crops** (Area in million hectares)

Particulars	Statistics	Area Under Production	Area Under Irrigation	Particulars	Area under Irrigation
Production of Rice	Pearson Correlation	.731**	.926**	Area Under Production of Rice	.688**
	Sig. (2-tailed)	.000	.000		.000
	N	31	29		29
Production of Wheat	Pearson Correlation	.968**	.930**	Area Under Production of Wheat	.901**
	Sig. (2-tailed)	.000	.000		.000
	N	31	29		29

Production of Sugarcane	Pearson Correlation	.980**	.859**	Area Under Production of Sugarcane	.862**
	Sig. (2-tailed)	.000	.000		.000
	N	31	29		29
Production of Cotton	Pearson Correlation	.930**	.295	Area Under Production of Cotton	.357
	Sig. (2-tailed)	.000	.120		.058
	N	31	29		29
*Correlation is significant at the 0.01 level (2-tailed).					
**Correlation is significant at the 0.05 level (2-tailed).					

**Source:** Data collected from Directorate of Economics & Statistics, DAC&FW and processed through SPSS

It is very interesting to see that the correlation of area under irrigation and production of sugarcane is 0.859, which is lower than the correlation of rice and wheat in this context. It may represent that the way irrigation is beneficial to the production of rice and wheat is not benefitting to the production of sugarcane. It is further observed that the correlation between Gross Capital Formation (GCF) and food grain production is 0.908 which is much more than the correlation (0.738) found between plan outlay on agriculture and food grain production. On the basis of all the statistical tables study rejects null hypothesis and accepts alternative one, which states, 'there is a significant difference in the production trend of the major crops, fisheries and livestock products'.

### Conclusions:

Production trend of rice and wheat is symmetrical but the gap between both is narrowing down in recent time. Production trend of cotton and milk seems rapidly increasing than rice, wheat and sugarcane. Production of sugarcane and area under production of sugarcane has very high positive correlation than the correlation of others in the same context. Production of wheat and area under irrigation of wheat has very high correlation than others. Rice stands at first position for the maximum area under production as compare to others but sugarcane stands at first position in the maximum area under irrigation followed by wheat. Area under production of wheat and area under irrigation of wheat has high positive correlation than any others correlation in this context. Furthermore gross capital formation and food grain productions are highly correlated than the plan outlay and food grain production.

India stands at third position (as per 2014 data) in the world production of eggs. There isn't any major business cyclical structure in the trend of production of Milk, Eggs and Fisheries. It only exists in the production of rice, wheat, sugarcane and cotton. The major reason for the linear production trend of Milk, Eggs and Fish is that, all these products are not dependent on monsoon but on non-monsoon and other factors. Fish production rose at the average rate of more than 8000 tonnes in last 2 decades. The reason behind it was the promotion and rapid growth of inland fisheries in India. Contribution of marine fisheries in the total fish production is now marginal whereas the contribution by inland fisheries is very significant. There is steady growth in the production of milk, eggs and fisheries than the cyclical growth trend of rice, wheat, cotton and sugarcane in last 31 years. Production data of cotton, milk, fish and eggs are positively skewed whereas the production data of rice and sugarcane is negatively skewed. There is further scope of research in the context of estimation of the future production trend.

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## An Assessment of Trends of Urbanization in India (1901-2011)

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### Abstract:

*Urbanization is the process of becoming urban. In other words, it is a demographic process whereby an increasing proportion of the population of a region or a country lives in urban area. Urbanization is a form of social transformation from traditional rural Societies to modern urban communities. It is long term continuous process. The objective of this paper is to understand the extent, trend and pattern of urbanization and also the consequences in the socio-economic context in India by using data from Census of India 1901-2001, NSSO etc. Urbanization in India trends, opportunities and smart cities. The urban population is growing in India and because of this, opportunities are increasing as well. According to country data, the urbanization in India is mainly due to the expansion of cities and the migration of people. Here we analyze the trends and decadal changes of urban population in India using census data of each decadal year.*

**Keywords:** Urbanization, Population size, Decadal growth, Trends of Urbanization.

### Introduction:

Urbanization is the process of becoming urban. In other words, it is a demographic process whereby an increasing proportion of the population of a region or a country lives in urban area. Urbanization is a form of social transformation from traditional rural Societies to modern urban communities. It is long term continuous process. The objective of this paper is to understand the extent, trend and pattern of urbanization and also the consequences in the socio-economic context in India by using data from Census of India 1901-2001, NSSO etc. It is an attempt to outline urban growth process and its consequences which have severe implications on policy issues. Before attempting an analysis of pattern and trends in urbanization in India, it becomes imperative to trace the process of urbanization in India through history because what distinguished India most, from many other countries of the world is its long tradition of urbanization dating back as far back as about five thousand years, when Indus Valley Civilization saw the birth of the earliest urban settlement in human history. In India, the urban tradition continued throughout these centuries and during the ancient period of our history there were many well planned, big and beautiful cities in different parts of the country. In ancient and medieval times it was cultural phenomena and many a times it happens due to political development because the rise and fall of new dynasties and kingdoms but in recent times, it is complementary of industrialization and socio-economic transformation; hence it becomes a socio- economic phenomenon.

The changes manifest themselves in the increasing concentration of population in human settlements, larger than villages, in the increasing involvement of the people in the secondary and tertiary production functions, and in the progressive adoption of certain social traits which are typical of traditional rural societies". Urbanization is not only accompanies to industrialization but it is also interlinked with modernization and these three sometimes work in conjunction. The process of urbanization in developed countries has been very slow but steady and it has been accompanied by agricultural and industrial revolution, higher per capita income and high standard of living, whereas in developing countries the rate of urbanization is very fast and it is not accompanied by industrialization but rapid growth of service sector in the economies (Helen Macbeth & Paul Collinson-2002). In the counties of third world urbanization has not been accompanied by modernization as well as Industrialization, i.e. a case of pseudo urbanization 'or over-urbanization'. In most of the developing countries the modern process of urbanization is a recent phenomenon and it is still unfolding. As this process is still unfolding in the developing countries it is revealing special features. The study of different aspects of urbanization is very important in order to have a proper understanding of the urbanization phenomena as well as policies to deal with it.

The Census of India recognizes all those settlements as urban which either have a statutory status like municipal committee/corporation/notified area committee/cantonment board, estate office, etc. or fulfill all the following three conditions simultaneously;

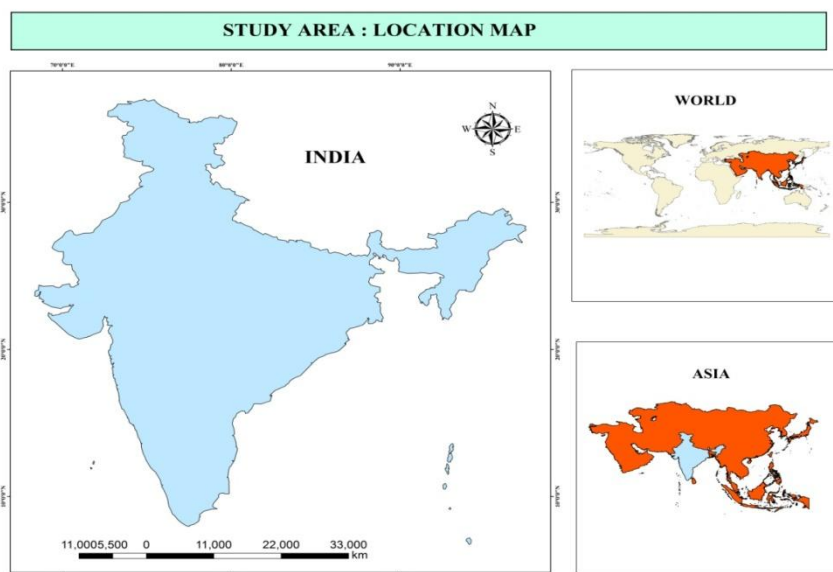
(i) A population of more than 5000;

(ii) More than 75 percent of the male working population is engaged in non-agricultural activities; and



(iii) Density of population is more than 400 persons per square kilometer.

**Study area:** India lies on the Indian Plate, the northern portion of the Indo-Australian Plate, whose continental crust forms the Indian subcontinent. The country is situated north of the equator between 8°04' to 37°06' north latitude and 68°07' to 97°25' east longitude.



Source: Survey of India, Diva Gis

**Figure 1: Study Area**

**Objectives:**

- To find out cause of urbanization in India
- To study trends of urbanization in India

**Database And Methodology:**

The present study is based on secondary sources of data. Secondary data collected through various available sources. The secondary data is collected from Census of India agencies and research organizations. For the analysis purpose various statistical techniques were employed viz; percentage, growth rate, trend graph, etc.

**Discussion:**

**Urbanization in India: Levels and Trends of Urbanization:**

India has been predominantly rural in character throughout the ages, though a few urban centers have flourished from time to time. It was only in the late nineteenth and the early twentieth century's that industrial cities grew in India. Urban population of India has increased from 25.8 million in 1901 to 62.4 million in 1951 and to 285.4 million in 2001, thereby showing more than tenfold increase in total urban population. The total urban population of India, according to Census 2001 is more than 10 percent of total urban population of the world. Most of the urban growth has been caused by accretion to the existing towns particularly the already large cities, while the pace of growth of new cities has been slow. However as compared to other developing countries, the urban spread in India is not that skewed and unbalanced, not it is characterized by any single city dominating the scene. Wide regional variation in urbanization is no less important a feature.

**Table 1: Trends of Urban Population in India (1901-2011)**

Census year	No of town	% of urban population	Decennial growth rate of urban pop.	Annual growth rate of population	Tempo of urbanization
1901	1827	10.84	0.00	0.00	0
1911	1815	10.29	0.35	0.03	-0.51
1921	1949	11.18	8.29	0.79	0.86
1931	2072	11.99	19.12	1.75	0.72
1941	2250	13.86	31.97	2.77	1.56
1951	2843	17.29	41.42	3.47	2.47

1961	2365	17.97	26.41	2.34	0.39
1971	2590	19.91	38.23	3.21	1.08
1981	3378	23.34	46.14	3.83	1.72
1991	3768	25.71	36.47	3.09	1.02
2001	4368	27.78	29.20	2.73	0.81
2011	7935	31.2	31.16	1.21	0.93

Source: Calculated from Census of India (1901-2011)

In the post independence period, the rate of growth of urban population in India has generally accelerated till 1981. It is only last two decades that it has shown a steady deceleration. The rates of urban population growth and urbanization have also shown a declining trend during 1981-91 and 1991-2001 period. This steady decline in the rate of urbanization at such a low level of urbanization is a matter of concern and needs attention from academicians, planners and policy makers

**Table 2: Distribution of Urban Population by Size Classes**

Census year	Number of towns by size class						% of urban population by size class					
	I	II	III	IV	V	VI	I	II	III	IV	V	VI
1901	24	43	130	391	744	479	26.0	11.2	15.6	20.8	20.1	6.1
1911	23	40	135	364	707	485	27.4	10.5	16.4	19.7	19.3	6.5
1921	29	45	145	370	734	571	29.7	10.3	15.9	18.2	18.6	7.0
1931	35	56	183	434	800	509	31.2	11.6	16.8	18.0	17.1	5.2
1941	49	74	242	498	920	407	38.2	11.4	16.3	15.7	15.0	3.1
1951	76	91	327	608	1124	569	44.6	9.9	15.7	13.6	12.9	3.1
1961	102	129	437	719	711	172	51.4	11.2	16.9	12.7	6.8	0.7
1971	148	173	558	827	623	147	57.2	1.9	16.0	10.9	4.4	0.4
1981	218	270	743	1059	758	253	60.3	11.6	14.3	9.5	3.5	0.5
1991	300	345	947	1167	740	197	65.2	10.9	13.1	7.7	2.6	0.3
2001	393	401	1151	1344	888	191	68.6	9.67	12.2	6.8	2.3	0.2

Source: Calculated from Census of India (1901-2001)

Class I: Greater than 100,000 pop.  
 Class III: 20,000-50,000 pop.  
 Class V: 5000-10,000 pop.

Class II: 50,000-100,000 pop.  
 Class IV: 10,000-20,000 pop.  
 Class VI: Less than 5000 pop.

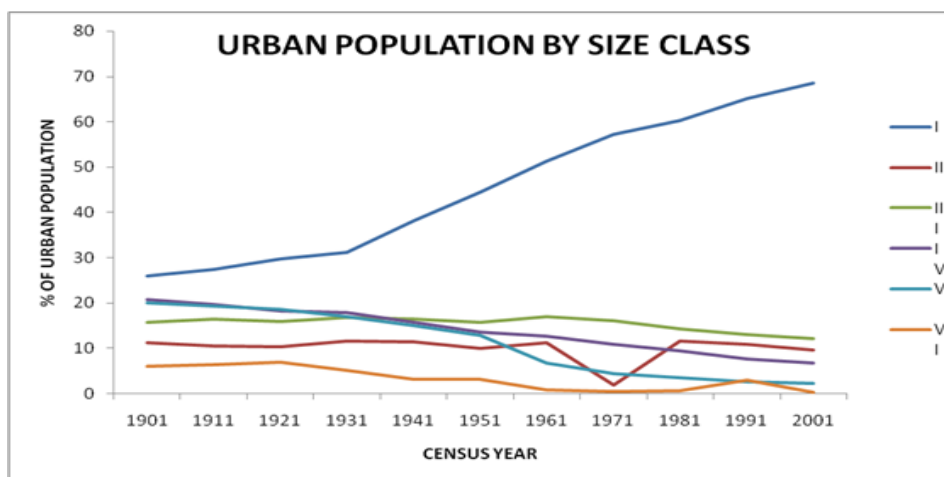


Figure 2: Urban Population by Size Class

Table 2 shows number of towns and percentage of urban population by size class of cities during 1901-2001. The pattern of urbanization in India is characterized by continuous concentration of population and activities in large cities (Kundu, 1983). Over the years it is found that there has been a continuous concentration of population in mega cities and decline in medium and small towns and cities. It is visible that number of cities by size class has increased in all categories except class VI. The share of all other cities except class I cities, has decreased especially class IV, V, and VI towns having less than 20,000 populations. The contribution of class I cities with population of 100,000 or

more has gone up significantly and the share of class I cities has increased from 26 percent in 1901 to 68.6 percent in 2001, that is almost three times. This shows the increase urban imbalance and inequality in the distribution of population. Indian subcontinent has experienced very slow urban growth during the initial decades of twentieth century and only about ten percent of people were living in urban area in 1901 and it had increased to about twelve percent till 1931 which was almost marginal. But after 1931, urbanization got pace in the Indian subcontinent and during 1941-1951 the annual growth rate was about 3.47 percent which was very high. In 1951 about eighteen percent person of total population of India was living in urban areas. During (1931-1951) there was six percentage point increase in total urban population and one of the most important reasons behind this high growth of urbanization was to large exodus of people because of partition of the Indian subcontinent. Some scholars attributed it to the vague definition of urban centers in the first Census conducted after independence. It was only after independence that urbanization started acquiring momentum. The growth rate of urban population was highest during the 1970s being 3.83 percent per year, which is highest during last century. The annual growth rate of urbanization has shown a declining trend during 1991-2001 it was only 2.73 percent which is lowest in the post independence era. In the first fifty years (1901-1951) of twentieth century total urban population increased about two and half times but in the second fifty years (1951-2001) total urban population has increased almost five times. Tempo of urbanization or the speed of urbanization refers to the change in the degree of urbanization during a period of time. The highest rate of change registered during 1941-1951.

**Table 3: Urban Population of India (1901-2011)**

Census Year	Total population (In million)	Urban population (in million)	% of urban population to total population
1901	238.3	25.8	10.83
1911	252.1	25.9	10.27
1921	251.3	28.1	11.18
1931	278.9	33.5	12.01
1941	318.6	44.2	13.87
1951	361.0	62.4	17.29
1961	439.2	78.9	17.96
1971	548.1	109.1	19.91
1981	683.3	159.4	23.33
1991	846.3	217.6	25.71
2001	1027.1	285.4	27.78
2011	1210.19	377.1	29.73

Source: Calculated from Census of India (1901-2011)

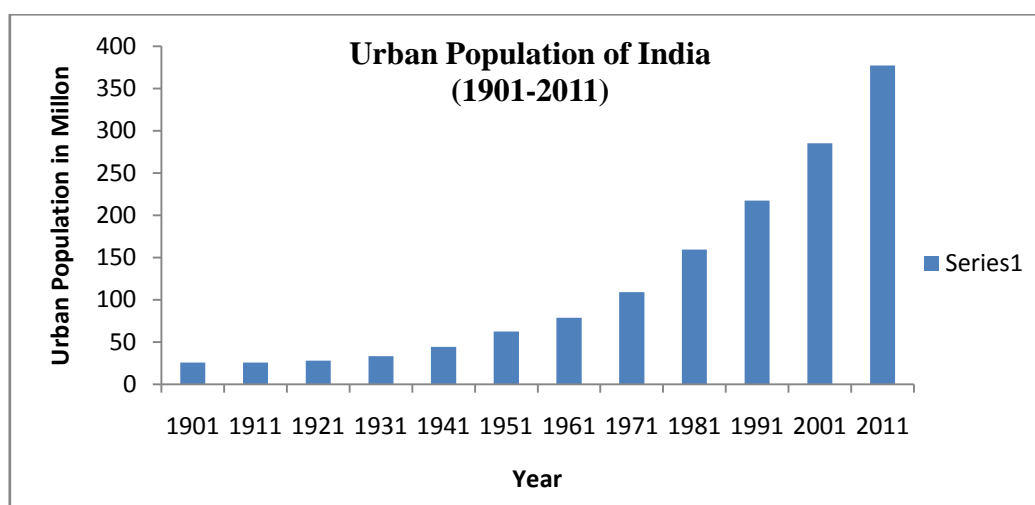


Figure 3: Urban Population of India

**Conclusion:**

Urbanization in India trends, opportunities and smart cities. The urban population is growing in India and because of this, opportunities are increasing as well. According to country data, the urbanization in India is mainly due to the expansion of cities and the migration of people. After detailed analysis, it is clear that there is continuous increase in urban population. In decade 1901 there is increase in urban population by 10 % and later on trend of increase in population goes on increases. In last decade of study (2011) the growth of urbanization is maximum, which is 29.73. As per observation the numbers of towns in India are also increases. In 1901 the total numbers of towns are near about 1800 and to the last decade of study the numbers of town are 7935. It represents seven times increase in number of towns.

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## Role of Information Technology in Agriculture and its Scope in India

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### Abstract

*Information of the required quality always has the potential of improving efficiency in all spheres of agriculture. The emerging scenario of a deregulated agriculture, thanks to WTO, has brought in a greater 'need' and urgency to make it an integral part of decision making by Indian agricultural community. Information Technology (IT) has a major role to play in all facets of Indian agriculture. In addition to facilitating farmers in improving the efficiency and productivity of agriculture and allied activities, the potential of IT lies in bringing about an overall qualitative improvement in life by providing timely and quality information inputs for decision making. The personnel who work for the welfare of Indian farmers, such as extension workers, do not have access to latest information which hinders their ability to serve the farming community effectively. This paper focusses on the scope for e-powering people who live in rural India as well as those who work for their welfare. The latest developments in IT that facilitate effective IT penetration to rural India, changing pattern of information requirements and role of IT, type of systems required in the post-WTO environment, the bottlenecks in e-powering rural India along with possible solutions are examined.*

### Information Commutation Technology and its Components

Induction of IT as a strategic tool for agricultural development and welfare of rural India requires that the necessary IT infrastructure is in place. The rapid changes and downward trend in prices in various components of IT makes it feasible to target at a large scale IT penetration into rural India. Some of the broad factors to be noted with respect to various components of IT are listed below :

- **Input devices:** Radical improvements are witnessed with respect to the means of communication by human beings with computers such as key boards, mouse devices, and scanners. The advent of touch screen monitors that allow users to give input to computers by touching on the appropriate location of the monitor has made it possible to develop user-friendly interface for farmers which is easy, intuitive, circumvents language barrier and at the same time provides a relaxed environment to the users. The present day digital cameras make it possible to capture and store good quality graphics and large video clips. The small size and low weight of these digital cameras, which are increasingly becoming affordable, open up the possibilities of providing computer based demonstration clips to educate the farmers. The digital cameras can also be used to upload plant stress related images, movie clips which can facilitate an expert residing at a far of location to quickly recommend a solution.
- **Output devices:** Monitor screens, printers & plotters, data projectors support high resolution and good quality output. The quality of these output devices have the potential of generating renewed interest in the farmers in using IT based services. The light weight portable data projectors can be easily carried by the agricultural extension personnel for serving larger audience. Similarly, speakers can also be attached to the computers to incorporate voice based trainings for farmers.
- **Processors:** The processing speeds of computers have gone up. At present, Intel P-IV based processors @ 1.5 Ghz are available in the PC range which makes it possible to undertake substantial processing of data at the client side.
- **Storage Devices:** 40GB and even higher hard disk drives have become common in PC range of computers. This makes it possible to store substantial information at the local level which facilitates faster access. Similarly, high capacity floppy disk drives, CDs make it possible to transfer large volumes of data to locations which can not be connected to networks immediately. These storage devices are also used for backup of crucial data. As a precaution, many corporates store their backups at locations away from the place of work.
- **Software:** Various operating systems are available which act as interface between the user and the machine. The graphic user interface (GUI) has become an accepted prerequisite for end users. Microsoft's 'Windows' continues to be a favourite in India. Application softwares which can support complex user requirements are available. Of the shelf solutions for office automation packages, groupware applications, complex database solutions, communication products, solutions



based on remote sensing & geographical information systems are available. In addition, solutions based on some or all of these are also readily available. The present downward trend in the IT industry provides an opportunity get customised application for any specific task developed at an affordable price. Rapid Application Development and Deployment (RADD) is a popular model for quick development and deployment of applications. Development environment itself is simplified with tools that quicken the pace of software specialists. Project management and monitoring software are available that facilitate efficient execution of large and complex applications that are required for rural India

- **Networking devices** : The capacity of modems, used to convert the data from digital to analog and vice versa, which are popularly employed to use telephone lines have increased. Internal modems are available integrated into the computer so that they are not exposed to outside environment. The capacities of other networking devices such as routers have also gone up which makes it possible to create large networks with smooth data transmission.
- **Transmission Media** : The media through which the data transfer takes place has also undergone revolutionary change. Telephone lines are still the popular source in India although the reliability and low bandwidth are still major issues. High capacity cables, optical fibre, radio, wireless local loops, satellite transmission and various solutions based on a combination of these are already being used in many parts of the country.
- **Other accessories**: Uninterrupted Power Supply (UPS) devices are crucial to ensure the longevity of the IT equipment as well as provide backup mechanisms. The potential of solar power packs to provide a feasible solution to shortage of power in the rural areas needs to be exploited.

### **Role of ICT in Agriculture**

In the context of agriculture, the potential of information technology (IT) can be assessed broadly under two heads : as a tool for direct contribution to agricultural productivity and as an indirect tool for empowering farmers to take informed and quality decisions which will have positive impact on the way agriculture and allied activities are conducted.

Precision farming, popular in developed countries, extensively uses IT to make direct contribution to agricultural productivity. The techniques of remote sensing using satellite technologies, geographical information systems, agronomy and soil sciences are used to increase the agricultural output. This approach is capital intensive and useful where large tracts of land are involved. Consequently it is more suitable for farming taken up on corporate lines.

The indirect benefits of IT in empowering Indian farmer are significant and remain to be exploited. The Indian farmer urgently requires timely and reliable sources of information inputs for taking decisions. At present, the farmer depends on trickling down of decision inputs from conventional sources which are slow and unreliable. The changing environment faced by Indian farmers makes information not merely useful, but necessary to remain competitive.

### **Changing Pattern of Needs - Post WTO**

While relevant information of the required quality always had the potential of improving efficiency in all spheres of activity of Indian farmer, the emerging scenario of a deregulated agriculture, thanks to WTO, has brought in a 'need' and urgency to make it an integral part of decision making. Consequently, deploying IT as a strategic tool for the benefit of rural India has assumed importance. Since information needs of the Indian farmers in general are documented extensively, it is more pertinent to focus on the theme in the context of challenges raised by WTO.

The broad information inputs required by farmers in the new scenario can be classified as.

#### **(i) Awareness Databases**

First and foremost, it is essential to provide unambiguous interpretation and implications of WTO for ordinary people. The jargon and the language under various articles of WTO require to be distilled by experts and their implications are clearly to be spelled out for all the segments of Indian agriculture and allied activities. The implications for all the stake holders and the time frames are to be spelt out. This is a priority item which is to be addressed immediately. The mandatory changes in government policies on tariffs, imports, yearwise phasing of the same, the impact on various subsidy schemes would be of concern to people.

An area of immediate concern to farmers is to get an analytical input on how his/her life is going to be affected. Since removal of restrictions throw open Indian agricultural markets, the macro economic situation related to foreign exchange, inflation, the current tariff structure within and outside the country etc. and their likely impact on Indian agriculture will have a direct bearing on the decisions of segments of Indian agriculture.

## (ii) Decision Support Systems for farmers

Indian farmer is cautious and usually tends to avoid risk. It is suggested that the provisions of WTO stipulating reductions in export subsidies on farm products will make Indian exports more competitive. It is estimated that the export potential may touch \$ 1.5 billion by 2005. In order to take advantage of the emerging order, the enterprising Indian farmer needs to be equipped with information that facilitates undertaking a proper SWOT analysis and compare it with conventional wisdom and satisfy himself on an appropriate course of action.

The data on cost of cultivation, efficient agricultural practices and availability of inputs will facilitate in assessing the strengths of indigenous products *vis a vis* the imports. Availability of information on the weaknesses as evident from the adverse affect of WTO on any specific agricultural product will help in taking the necessary corrective measures. In the emerging scenario, competitive advantage is required to be fully exploited to improve export potential. *India is believed to have competitive advantage in areas like fruits, oil seeds, cotton, milk products. Special thrust may be accorded to these sectors to meet international standards.* Opportunities for specialisation may lead to better export potential. Similarly, forecasts on threats in terms of information related to cheaper imports, macro-economic conditions of other countries are also required.

## (iii) Systems that facilitate Indian farmers to forge appropriate alliances for collective benefit

The size of land holdings is a major barrier in exploiting any export potential. In order to remain competitive and derive better price realisations, it will be imperative for the farmers to come together through cooperative alliances. It is possible to relieve the farmers of geographical barriers by facilitating farmers to come together online and facilitate disposal of their produce at attractive prices. Online bidding can be introduced for various agricultural product categories. This will require development of complicated IT systems which are to be supported by proper bricks and mortar infrastructure and post harvest technologies, storage, etc.

## (iv) Opportunities in the new order

It is necessary to equip Indian farmers to come together for value additions to their agricultural output. This will get them better returns from their produce and at the same time generate new employment opportunities in the rural sector. This will require systems to provide information to farmers on agro processing industries, aqua culture units, animal husbandry, Floriculture, etc. The opportunities for setting up such units, procedures related to exports, the quality norms to be adopted, packaging, etc. Are to be made available.

## (iv) Monitoring

Since the domestic agricultural scene is exposed to international fluctuations, it is necessary to be vigilant to external shocks. Systems to monitor international market status, international supply - demand scenario, macro economic factors, political disruptions are required to be developed. Advance warning systems to alert the farmers are required to be developed. It is necessary to promote monitoring cells in all major institutions related to agriculture and allied activities to maintain data, provide periodic analytical reports and raise advance alerts.

**IT and Indian Agriculture in the Future**

Technologically it is possible to develop suitable systems, as outlined in the previous sections, to cater to the information needs of Indian farmer. User friendly systems, particularly with content in local languages, can generate interest in the farmers and others working at the grassroots. It is possible to create dedicated networks or harness the power of Internet to make these services is available to all parts of the country.

The task of creating application packages and databases to cater to complete spectrum of Indian agriculture is a giant task. The Long Term Agriculture Policy provides an exhaustive list of all the areas that are to be covered. This can be taken as a guiding list to evolve design and develop suitable systems catering to each of the specified areas. Our country has the advantage of having a large number of specialised institutions in place catering to various aspects of Indian agriculture. These institutions can play a crucial role in designing the necessary applications & databases and services. This will facilitate modularisation of the task, better control and help in achieving quick results. As it is, several institutions have already developed systems related to their area of specialization.

For quick results, it may be useful to get the applications outsourced to software companies in India. This will facilitate quick deployment of applications and provide boost to the software industry in India. In order to avoid duplication of efforts, it may be useful to consider promoting a coordinating agency which will have an advisory role to play in evolving standard interface for users, broad design and monitoring of the progress.

In the post WTO regime, it is suggested that it is useful to focus more on some agricultural products to maintain an unquestionable competitive advantage for exports. This will call for urgent measures to introduce state of the art technologies such as remote sensing, geographical information systems (GIS), bio-engineering, etc. India has made rapid strides in satellite technologies. It is possible to effectively monitor agricultural performance using remote sensing and GIS applications. This will not only help in planning, advising and monitoring the status of the crops but also will help in responding quickly to crop stress conditions and natural calamities. Challenges of crop stress, soil problems, and natural disasters can be tackled effectively through these technologies. A beginning in precision farming can be encouraged in larger tracts of land in which export potential can be tilted in our country's favour.

While developing these systems it is necessary to appreciate that major audience that is targeted is not comfortable with computers. This places premium on user friendliness and it may be useful to consider touch screen technologies to improve user comfort levels. It is often observed that touch screen kiosks, with their intuitive approach, provide a means for quick learning and higher participation. It is also necessary to provide as much content as possible in local languages.

Once the required application packages & databases are in place, a major challenge is with respect to dissemination of the information. The Krishi Vigyan Kendras, NGOs and cooperative societies may be used to set up information kiosks. Private enterprise is also required to be drawn into these activities. These kiosks should provide information on other areas of interest such as education, information for which people have to travel distances such as those related to the government, courts, etc. Facilities for email, raising queries to experts, uploading digital clips to draw the attention of experts to location specific problems can be envisaged.

#### Constraints and Remedies for Effective Dissemination

Some of the major constraints delaying the spread of e-revolution to rural India are listed below :

- **Haphazard development:** It is observed that some initiatives have already been made to provide IT based services to rural community. However, duplication of efforts are witnessed as most of the services revolve around limited subjects. Keeping in view the giant task involved, it is necessary to form a coordination mechanism to strive for a concerted effort to support farming community in the country. Such a coordination agency may only have advisory powers such as user interface, broad design, and delivery mechanism of the content, standards for setting up kiosks.
- **User friendliness:** The success of this strategy depends on the ease with which rural population can use the content. This will require intuitive graphics based presentation. Touch screen kiosks are required to be set up to encourage greater participation
- **Local languages:** Regional language fonts and mechanisms for synchronisation of the content provides a challenge that needs to be met with careful planning.
- **Restrictions:** Information content based on remote sensing and geographical information systems can provide timely alerts to the farmers and also improve the efficiency of administration. These applications can have a major impact on the farmers and help them to appreciate the potential of information technology. However, government's *map restriction policies* often threaten to stifle the optimal utilisation of these tools.
- **Power Supply:** In most of the rural India, power supply is not available for long hours. This will reduce the usefulness of the intended services. Since almost entire country receives sunshine for most part of the year, it is useful to explore *solar power packs for UPS as well as for supply of power*. The Ministry of Non-conventional Energy Sources may pay special attention in this area which can be a major contributor to the growth of IT in villages.

**Connectivity:** Despite the phenomenal progress made in the recent years, the connectivity to rural areas still requires to be improved. Reliable connectivity is a prerequisite for a successful penetration of IT into rural areas. Many private ISPs are setting up large networks connecting many major towns and cities. Since some of these networks pass through rural areas, it is possible to provide connectivity to a large number of villages. Several technologies exist that can be utilised for connecting rural areas. Cable network is a possible medium for providing the last mile connectivity to villages.

- **Bandwidth:** Even in areas where telephone and other communication services exist, the available bandwidth is a major constraint. Since internet based rural services require substantial use of graphics, low bandwidth is one of the major limitations in providing effective e-services to farmers. As already stated, networks with high bandwidth are being set up by several companies passing through rural segments which can be utilised. Until this materialises, a two pronged strategy of storing static information at the kiosks and providing dynamic information from remote locations can be examined. The graphic oriented content which does not change frequently, such as, demonstration clips for farmers, can be stored on the

local drives at the kiosks and arrange for periodic updation of this information over the network during non-peak hours. The dynamic information which changes more frequently can be accessed from remote locations to obtain the latest status.

- **Dissemination Points:** Mass deployment of information kiosks is critical for effective use of the Internet based content and services. In order to ensure that the information kiosks are economically feasible, it is necessary to make the proposition sustainable and viable. This requires a major focus on a viable revenue model for such kiosks. In the new information era, the kiosks should be designed to become electronic super markets that can, in addition to being information sources, handle other services of use to the people living in rural areas. The revenue available through such sources can make a kiosk attractive for prospective investors..
- a) **Distance education** - A large number of people travel substantial distances to attend educational courses. It is possible to set up virtual class rooms right in their villages
- b) **Training** - People living in rural areas require training and a means for upgrading their skills in their area of work. It is possible to provide quality education right at their door steps with facilities for online interaction with experts. For example, a village teacher or a paramedical staff can keep abreast latest developments without disturbing his/her routine. Similarly, training can be imparted on various aspects of agriculture such as correct practices, irrigation practices, efficient utilisation of tools used in farming such as tractors.
- c) **Insurance** : The advent of private players into insurance has brought about advanced IT systems that can render services over networks. The kiosks can be insurance agents for insurance firms which, in turn, can compensate the kiosk operators for online transactions for new business as well as maintaining the old.
- d) **Local Agent:** Many companies have difficulty in working out logistics for their supplies to rural outlets. A rural kiosk can act as conduit for such 'bricks and mortar' companies. This has the potential of transforming a rural kiosk into a profitable venture.
- e) **Rural Post Office:** The kiosks can facilitate sending and receiving emails, facilitate 'chats' with experts. Several successful rural kiosks are already available in many states which run essentially on this model.
- f) **e-Governance:** Rural kiosks are the stepping stones for effective implementation of e-governance. Details related to central / state / local governments, formats and procedures, status verification such as case listings in courts, filing of applications in electronic format where admissible, etc. are some of the areas where kiosks can be of major use.
- g) **Online examinations:** Online certification examinations are 'in things' with many organisations and certification agencies. Many people are forced to stay at metros to take the examinations. *Eventually* it should be possible to conduct these examinations through the rural kiosks.

### Conclusion

The Indian farmer and those who are working for their welfare need to be e-powered to face the emerging scenario of complete or partial deregulation and reduction in government protection, opening up of agricultural markets, fluctuations in agricultural environment and to exploit possible opportunities for exports. The quality of rural life can also be improved by quality information inputs which provide better decision making abilities. IT can play a major role in facilitating the process of transformation of rural India to meet these challenges and to remove the fast growing digital divides.

The rapid changes in the field of information technology make it possible to develop and disseminate required electronic services to rural India. The existing bottlenecks in undertaking the tasks need to be addressed immediately. A national strategy needs to be drawn for spearheading IT penetration to rural India. A national coordinating agency with an advisory role can act as a catalyst in the process.

The success of any IT based service to rural India hinges on evolving a proper revenue model for the dissemination points. The 'clicks & mortar' rural kiosks should be integrated with the 'bricks & mortar' industry to make them sustainable ventures by making them a business gateway to rural India. The information kiosks can draw revenue from the industry by providing and disseminating required services. Once these dissemination points prove to be economically viable, the IT revolution in rural India will require no crusaders.

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## Problems And Prospects Of Dairy Co-Operatives In India

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*The milk co-operative movement has in it the seeds of a social revolution; it is a means to an end. It will inculcate the spirit of co-operation among the rural folk of the country and can prove to be instrument of initiating the process of rural development. Co-operative dairying is an agency through which the farmers can be made to realize their inherent strength and improve the milk production potential to better the social economic life of millions of small and marginal farmers and landless cattle owners scattered all over the Country. Dairy farming as an allied agricultural activity can play a significant supporting role in keeping the farmer busy through the year and providing him a steady income. Dairy is an important supportive occupation to millions of poor families in India and prevents migration of rural youth to the cities. For women rural laborers this is very useful source of income with self respect and self sufficiency. But, the dairy co-operatives in India are facing several challenges, however the united effort if taken by them, they can survive in future. They need to apply scientific and professional management. So there is an urgent need to adopt professional and market oriented approach in this sector. The efforts in this direction will offer a bright future to the dairy co-operatives.*

**Keywords:** Social Revolution, Self respect, Self Sufficiency, Professional Management

### Introduction:

Agriculture is the main occupation in India. Even though, the share of agriculture in GDP of India shows a falling trend, its significance as a means of livelihood is important today also. Agriculture coupled with the allied activities like diary, poultry, etc. which play a very vital role in achieving all round economic development of the rural economy.

Milk is an essential commodity in human diet; it is regarded as the most complete single food available in nature. From national point of view milk contains nearly all the essential food constituents required in the human diet. "In India where a large proportion of the population, nearly 40% is vegetarian milk and milk products are of special value as they are the only source of animal protein in its diet". But in India per capita consumption of milk is very low. Most of the milk produced in rural areas of India, but the profitable market is in urban area.

After 1991, the new economic policy has brought about the number of changes on these allied activities. On this background, it will be vital importance to study growth, problems and prospects of dairy co-operatives. The present paper is an attempt towards this.

### Objectives:

1. To study the role of dairy co-operatives in economic development of India.
2. To indentify the challenges before dairy co-operatives.
3. To suggest measures for the development of diary co-operatives in India.

### Division Of The Paper:

The present paper is divided into three parts. First part explains the role of diary co-operatives in economic development of India. Second part identifies the challenges before dairy co-operatives and third part suggests some measures for the development of dairy co-operatives in India.

### Methodology:

The present paper is based on secondary data. Various books, articles, magazines related to dairy development in India are used for the present paper.

### Role Of Dairy Co-Operatives:

It was only after the co-operative societies Act was passed in 1912 that the first co-operative dairy society was set up in 1913 at Allahabad. However, it was under the plans that the dairying in the co-operative sector made considerable progress.

The milk co-operative movement has in it the seeds of a social revolution, it is a means to an end it will inculcate the spirit of co-operation among the rural folk of the country and can prove to be instrument of initiating the process of rural development through diffusion of knowledge and information of modern techniques of cultivation development of dairying and animal husbandry on a planned scientific basis and above all create a healthy environment co-operative dairying is an agency through which the farmers can be made to realize their inherent strength and improve the milk production potential to better the social economic life of millions of small and marginal farmers and landless cattle owners scattered all over the country.

Although agriculture is the principal occupation of the country, it does not keep the farmer busy all the year round. He remains almost idle during the off-season under such conditions cattle husbandry



and dairy farming as an allied agricultural activity can play a significant supporting role in keeping the farmer busy through the year and providing him a steady income.

Cooperative sector has played a very important role in socio-economic development of India. Dairy, Poultry, Sugar factories are the main agro based industries. India has achieved phenomenal progress in co-operative dairying during the past four decades. Country's milk production has increased steadily over the years. Per capita availability of milk has grown up significantly. Indian brands of dairy products not only rule domestic markets but sold in many other countries also. Dairy is an important supportive occupation to millions of poor families in India and prevents migration of rural youth to the cities. For women rural laborers this is very useful source of income with self respect and self sufficiency. This is true women empowerment.

In India since 1970 the milk co-operatives have developed and increased in number that is after operation floods. Milk productions are considered as a reasonably profitable side business to farming. Milk production can give permanent type of employment. Unlike farming which is seasonal. In this business all men, women and children can participate especially, women can do it at home. It is necessary to increase the participation of women if the progress of milk Co-operatives is to be achieved better than today. Dairy is absolutely necessary as this will amount to liberation of women on one hand and supplementing the sources of family income on the other. This would also be an attack on poverty.

The dairy co-operatives contribute in rural development in terms of poverty alleviation, increase in education as well as income level and improve in health services. It also moves rural people from farm employment to non-farm employment and thus reduces the burden on agriculture. In Maharashtra **AMUL**, **WARANA**, **GOKUL** etc. these milk co-operatives has proved themselves as ideal examples in dairy industries.

Milk is considered to be one of the most sensitive agricultural commodity, so it requires special and timely care and this can be provided conveniently as well as through the collective operation of dairy co-operatives. After from the collection and marketing of milk, the milk co-operatives also provide animal feed, fodder seed, fertilizers, credit, training and education.

Thus the dairy co-operatives have proved to be a strong economic institution for improving the condition of rural poor.

#### **Challenges Of Dairy Co-Operative:**

Despite the remarkable achievements Indian dairy co-operative are today encountering some critical problem and challenges. They are:

1. Entry of private dairies under Milk and Milk product
2. Restrictive co-operative laws and policy support
3. Regional imbalance
4. Low capacity utilization of dairy plants
5. Low productivity of milch animals
6. Ineffective procurement
7. Lack of institutional support in providing quality research, education, training and technological experiments
8. Lack of govt. support in protecting dairy co-operatives from extreme fluctuations in prices
9. Acute shortage of feed and fodder
10. Poor health services
11. Poor extension support
12. Poor artificial insemination performance
13. Apathy of youth towards the dairy occupation etc.

#### **Suggestions:**

Following suggestions would be helpful in the development of co-operative dairy-Provision of Self Support Credit model for milch animals, Infant cattle orphanage home, amalgamation of milk societies, need for the government protection, need for strict quality control, involvement of youth in dairy business, controls and regulations on private sector dairy.

In short, the dairy co-operatives in India are facing several challenges, however the united effort if taken by them, they can survive in future. They need to apply scientific and professional management.

We have achieved white revolution in the country, but it is not balanced, equal and proportional. Without increasing productivity efficiency and competitiveness, it is very difficult for dairy industry to survive. So there is an urgent need to adopt professional and market oriented approach in this sector. The efforts in this direction will offer a bright future to the dairy co-operatives.

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## Agri-Tourism In India

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### Abstract

*Agricultural tourism is a type of tourism that has seen a boost in popularity within recent years. It allows people to stay at fully functioning farms in order to observe the work routines and activities that are undergone in the agriculture business on a day-to-day basis. Agri-tourism is defined as travel, which combines, agriculture and rural setting with product of agriculture operation all within a tourism experience. The concept of Agri tourism is very simple, whereby the urban tourists go the farmers home; stay like a farmer, engage in farming activities, experience the bullock cart, tractor ride, fly kites, eat authentic food, wear traditional clothes, understand the local culture, enjoy the folk songs and dance, buy fresh farm produce and in turn the farmer maintains home and farm hygiene, greets new tourists, sells his farm produce at a better price, earns a livelihood all year round. More than a profession or a business, agriculture is India's culture. Hence, adding additional income generating activities to existing agriculture would certainly increase contribution of agriculture in the national GDP. Serious efforts need to be made in this direction and Agri-Tourism is one such activity. Any opportunity to visit villages and spend time with family is dream of any urbanite. Moreover it creates awareness about rural life and knowledge about agriculture science among urban school children. This provides unique opportunity for education through recreation where learning is fun effective and easy.*

**Keywords:** Agri tourism, popularity, GDP, awareness, education

### Introduction

Agricultural tourism is a relatively new market for tourists. Agricultural tourism is a worldwide trend, which offers city dwellers a chance to escape urban concrete and re-discover their rural roots. The interaction of individuals with farm life also carries an educational aspect. People tend to enjoy learning about items and processes that they will not participate in directly. Agri-tourism or Agricultural tourism is becoming an important tourism development opportunities and more of the population have moved to the city and have lost their connection to where agriculture is produced. "Agricultural Tourism" includes a set of economic and social activities that occur and link travel with the products, services, and experiences of agriculture. Agricultural tourism is a type of tourism that has seen a boost in popularity within recent years. It allows people to stay at fully functioning farms in order to observe the work routines and activities that are undergone in the agriculture business on a day-to-day basis. Agri-tourism is defined as travel, which combines, agriculture and rural setting with product of agriculture operation all within a tourism experience. Experience itself is the Agri tourism product, besides Tourists can buy fresh Agri produce and products directly from farmers without any middle man (agents). Agri-tourism is the latest concept in the Indian tourism industry, which normally occurs on farms. It gives us the opportunity to experience the real enchanting and authentic contact with the rural life, taste the local genuine food and get familiar with the various farming tasks during the visit. It provides us the welcome escape from the daily hectic life in the peaceful rural environment. It gives us the chance to relax and revitalize in the in the pure natural environment, surrounded by magnificent setting. To see the real India and have the experience of the lifetime on the farm stay holidays.

### The Concept

The concept of Agri tourism is very simple, whereby the urban tourists go the farmers home; stay like a farmer, engage in farming activities, experience the bullock cart, tractor ride, fly kites, eat authentic food, wear traditional clothes, understand the local culture, enjoy the folk songs and dance, buy fresh farm produce and in turn the farmer maintains home and farm hygiene, greets new tourists, sells his farm produce at a better price, earns a livelihood all year round. Agri tourism is a form of niche tourism that is considered a growth industry in many parts of the world today, including India, Australia, Canada, the United States, and the Philippines. Other terms associated with agri tourism are "agritainment," "value added products," "farm direct marketing" and "sustainable agriculture." The founder of the concept in India is Pandurang Taware who is called the Father of Agri Tourism Concept in India. A humble attempt to implement and start the Pilot Project of Agri Tourism by

ATDC was made under leadership of Mr Pandurang Taware in 2005 in Malegaon near Baramati in Maharashtra, where the Agri Tourism was demonstrated on Agriculture Development Trust's farm. According to him, "Urban population is increasing day by day. Today, urban children's world is restricted in the close doors of a school, home and centre around television, video game, computer, fast food and internet. Living in urban area, they have not enjoyed the beauty of Mother Nature. Agri Tourism Development Corporation, did the research in 2004, and found that 43% of urban population did not have any relative left in the village. 97% of urban population wants to experience the rustic beauty of village life. This gives an opportunity to develop tourism centre in the village based on agriculture activities and other side Farmers in village are engaged in farming activity throughout the year. Their incomes from farm produce depend on good monsoon, good harvest and good marketing. It is experienced that the income from agriculture farming is only once or twice in the year, but the expenses are on weekly basis, it is very difficult for the farmer to sustain throughout the year, since the income is not sufficient. To make farming sustainable and feasible there was an urgent need of some experiment in addition to the traditional farming, after three years of consistent research and studies."

### Scope of Agri-Tourism in India

Agriculture is the backbone of Indian Economy. Around 75% of the population is directly or indirectly dependent on Agriculture and almost 26 percent of India's GDP comes from Agriculture. 90 million farmers are dwelling in 6.25 lack villages producing food grains for feeding the country. More than a profession or a business, agriculture is India's culture. Hence, adding additional income generating activities to existing agriculture would certainly increase contribution of agriculture in the national GDP. Serious efforts need to be made in this direction and Agri-Tourism is one such activity. Tourism is termed as an instrument for employment generation, poverty alleviation and sustainable human development. To promote domestic tourism, thrust areas identified by Government of India are development of infrastructure, product development and diversification, development of eco-adventure sports, cultural presentations, providing inexpensive accommodation, streamlining facilitation procedures at airports, human resource development, creating awareness and public participation and facilitation of private sector participation. In this process, important stakeholders are State and Central Department of Tourism, Indian Institute of Tourism and Travel Management, Tourism Development Corporations, Foreign Embassies, Travel Agents Association of India (TAAD), Indian Association of Tour Operators (IATO), Tourists, Transport Operators Association, Indian Convention Promotion Bureau and Pacific Asia Travel Association (PATA). Buoyed by the growing popularity of homestays in India, farm stays (essentially a homestay on a farm) are blossoming across the country. They provide an authentic and interactive experience of rural life, in the delightfully fresh country air. These farmstays are among the best in India and range from simple to sublime.

### Places of Agri-Tourism in India

A large number of agri tourist farms have developed throughout the country- highest share is of Maharashtra followed by Kerala.

1. **Dewalokam** is the organic ancestral farm of a welcoming Syrian Christian family. This faultless farmstay is conveniently located only 90 minutes' drive from Kochi airport, in the spice belt of Kerala, bounded by a tranquil river and nature reserve. Fruit, vegetables, spices, milk, and honey are all produced there. An extensive range of activities is available for guests, including spice walks, village walks, bamboo rafting, temple visits, and cow milking. Or, simply chill in a hammock! Yoga, Ayurveda, and cooking holidays are also offered.
2. Another fabulous Kerala farmstay run by a Syrian Christian family, **Vanilla County** consists of a 60 year old heritage bungalow on a 150 acre organic rubber and spice plantation. It's located a bit over 2 hours' drive from Kochi airport.
3. **Maachli** is a divine farmstay, situated in Parule village on the far south Konkan Coast of Maharashtra. The closest beaches are Bhogwe and Tarkarli. Everything revolves around nature, and there is a sweet water stream flowing through the property. Responsible tourism is also a strong focus. Activities include village walks, cooking lessons, farming experiences, trekking.
4. **Dwarka** is a bright and modern farmstay on a 15 acre orchard, also in Maharashtra's Sindhudurg district. It's located in Sawantwadi, approximately 30 minutes' drive inland from unspoilt Vengurla beach. Mangoes, coconuts, cashews, and fruit are grown there. There's also a dairy on

the property. Interesting activities are offered, such as a visit to a pottery village, bamboo workshop, and mat weaving.

5. **Dudhsagar Plantation** is located at the foothills of the Western Ghat Mountains in sedate south Goa. The farm was started in 1985 and has a vast variety of organic fruit trees, spices, medicinal plants, herbs and flowers. Free range chicken and dairy farming is also carried out there. Jeep rides to remote Dudhsagar waterfall start 15 minutes from the property.
6. **Destiny Farmstay** is secluded away around 25 kilometres from the popular hill station of Ooty. It has a stable full of horses, cows, sheep, rabbits, guinea pigs and geese. And, of course, farm dogs to watch over them. A huge range of produce is grown on the farm, including coffee, spices, fruit, vegetables, herbs and flowers.
7. **Citrus County** is one of the biggest success stories where farm stays in Punjab are concerned. It's located on the way to Amritsar. As its name suggests, citrus fruit is farmed there in a 70 acre orchard. Guests can go fruit picking, explore local villages, visit a dairy farm, and learn how to cook Punjabi food.
8. **Prakriti Farms** is a non-profit organic farm, located around an hour from Chandigarh, in Punjab. It has a much more rustic feel. The owners, alarmed by the surrounding disrespect **for nature**, are slowly recreating an ecological environment on the land inherited from their ancestors.
9. The tantalizing **Tathagata Farm** offers an opportunity to get back to nature on a tea estate up in the hills, 45 minutes from Darjeeling. In addition tea, the farm grows cardamom, ginger, vegetables, oranges and other crops. Possible activities include plantation tours, trekking, nature trails and guided walks, fishing, picnicking and birding.

The farms offer various activities for the tourists as well. Tourism provides us the opportunity to stay right away in the farms houses along with the other villagers and experience the difference, to witness the unique lifestyle of the villagers. One can learn about their age old traditions and culture, which they resume till date. Converse with them and feel how warm hearted and simple they are. Along with them spend time playing the pleasing rural games such as taash (cards) and kho kho. There are interesting bull fight and wrestling matches held on various occasions in the village. Cow milking is real exciting activity, which can't be escaped. One can practice the art of cow milking from the villagers, feed the cows with the fodder and chapatis. Villages are expert in making the handicrafts, it is something which is passed on from their one generation to the other. We can also participate in the village seasonal harvest fair and festivals. Onam, Baishaki and Pongal are some of the village most famous harvest festivals. One can enjoy the traditional dance and music performed by the villagers on such occasions.

### **Importance of Agri-Tourism**

As commercialism and mass production become the standards by which we live, agri tourism has given people who work in the agricultural and horticultural sectors a chance to share their work with the masses. Some agri tourism experiences allow guests to buy food products grown on the farm or hand-crafted products made by the farmers' families; purchasing these goods helps provide farmers who rely on their land with another source of income. The potential benefits of agri tourism development extend to farmers, rural communities, and tourism operators.

**Benefits for Farmers:** Expanding farm operations, developing new consumer market niches, increasing awareness of local agricultural products, increasing appreciation of the importance of maintaining agricultural land, improving farm living conditions, working areas and farm recreations opportunities, increasing long term sustainability for farm business.

**Benefits for Communities:** Increasing protection of rural landscape and natural environment for tourists and residents, helping preserve local tradition, art and craft, promoting inter-regional and inter-cultural communication, increasing awareness of agricultural issues and values, helping to diversify and strengthen rural economy.

**Benefits for Tourism Operators:** Increasing tourist flow in to diversified rural regions, bringing more non-local currency to local business, increasing season length during traditionally off peak business periods.

### **Conclusion**

Modern life is the product of diversified thinking and diversified activities. Every individual attempts to work more, in different directions to earn more money to enjoy modern comforts. Modern lifestyle has made the life stressful and average life span has come down. Hence, people are in constant search of pro-nature ways and means to make life more peaceful. Hence, peace is always out

of his system. Tourism is the means for searching peaceful location. Peace and tranquillity are inbuilt in Agri-tourism as it is away from urban areas and close to nature. Cities are growing at the cost of villages. Villagers are migrating to cities in search of jobs and seeking comforts of modern life. Hence, yesterday's villagers are today's urbanites. Deep in the heart of urbanites lies the love and respect for their ancestors and villages. Hence, visit to villages satisfies their desire. This is also expressed through the heartedness of urbanites to flat culture and love for farmhouses located in the outskirts of cities. Any opportunity to visit villages and spend time with family is dream of any urbanite. But, minimum decent facilities are always problem. Agri-tourism attempts to overcome this problem. Moreover it creates awareness about rural life and knowledge about agriculture science among urban school children. This provides unique opportunity for education through recreation where learning is fun effective and easy.

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## Geographical Study Of Fruit Farming In Solapur District

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### Abstract

*Fruits and vegetables contain a variety of nutrients including vitamins, minerals and antioxidants. Fruits are rich in fiber which is very essential for the smooth movement of the **digestive system**. There are some fruits that give body energy as they contain carbohydrates which are the main source of energy. **Carbohydrates** in **fruits** are mainly sugar which actually breaks down easily and make a quick source of energy. They also contain **minerals, vitamins** and **nutrients** that are useful for a healthy life. They are easy to cook and digest easily. Some of the popular and healthy fruits that can be consumed in daily everyday meal are **apples, banana, grapefruit, mango, orange, strawberry, guava, papaya, watermelon, muskmelon, sweet lime** etc. Solapur district is a drought prone region of Deccan plateau onto temperature is high as more than 40°C in summer season and falls down 10°C and rainfall is 67cm. Due to the inadequacy of water supply to agricultural activities and moderate rainfall condition of district, there is a very little scope for fruits cultivation in the district. In spite of more than 21 sugar factories in district, irrigated area shows only sugarcanes. But drought farming technique is become advantageous to small and medium sized farmers to adopt fruits cultivation where irrigation is available. Hence area under fruits cultivation was about 1.33 % in 1995-96 and it changes about 2.42% in 2010-11 to total cropped area in the district. Therefore an attempt is made to focus on changing fruits and vegetable cropping pattern in the district from 1995-96 to 2010-11.*

**Keywords:** Landuse, Change of volume cropping pattern crop, Total fruits cultivation area (TFCA)

### Introduction

There is a greater scope for fruits and vegetable cultivation in agriculture. But it requires adequacy of water supply for its growing period and it gives definitely more income to farmers than traditional crops. Solapur district is one of the district in Maharashtra state which shows a favorable climatic & soil condition for fruits and vegetable cultivation. Solapur district is a drought prone region where temperature ranges between 10°C in winter season & 44°C in summer season and the annual rainfall is 667.10 mm. There is a constant irrigation development found in the district which may helpful for increasing fruits and vegetable cultivation. Some fruits like pomegranate, guava, ber requires less quantity of water supply upto its ripening that a greater advantages to farmers to cultivate in that drought prone region.

### Objectives:

By keeping, the perspective agricultural development view in mind, the paper investigates the following objects as

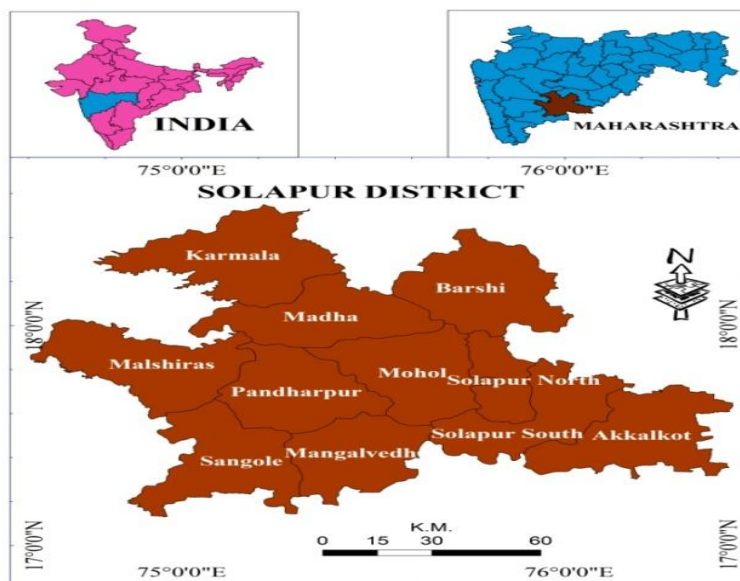
- 1) To study the fruit cultivated area and irrigated area under fruits cultivation in district.
- 2) To study the fruit farming pattern within Solapur district.
- 3) To study the changing fruit farming pattern in Solapur district.

### Study Area:

The Solapur district is one of the most important district of Maharashtra state both in terms of population and area. It lies entirely in the Bhima basin and located in between 17°10' North to 18°32' North latitudes and 74°42' East to 76°15' East longitude. The total geographical area of Solapur district is 14895 Km<sup>2</sup> according to 2011 census. The region under studies constitutes 4.88 % area and 4.51 % population of Maharashtra state. It ranks fourth in terms of area and seventh in term of population among the district of Maharashtra. Physiographically the region is divided into three major divisions such as hilly region, the plateau and low land plain region. The region is drained by the river Bhima and its tributaries. The climate of Solapur is monsoon climate.

The district entirely lies in drought prone area of Maharashtra state. The region is divided into four seasons of cold, hot, monsoon and post monsoon. The yearly temperature ranges between 10° C to 44° C. The annual rainfall is 667.10 mm.

**LOCATION MAP OF SOLAPUR DISTRICT**



**Data base & Methodology:**

The data collected and used for the period 1995-96 and 2010-11 comes from secondary sources. These secondary data obtained from the district Statistical department, socio economic review, District socio economic review, District statistical abstract, District census handbook, Bulletins, season and crop reports published by Agricultural department.

**Results and Discussion**

**1) Fruits Cultivation Area, Irrigated area under fruits cultivation in Solapur district.**

Table No. 1:- Proportion of Irrigated Area under Fruits Cultivation to Net Irrigated Area of tahsil in Solapur District.

Proportion of Irrigated Area under Fruits Cultivation to Net Irrigated Area of tahsil in Solapur District.							
Tahsil	Fruits Cultivated Area in Ha		Irrigated Area under Fruits Cultivation in Ha		Proportion of Irrigated Area under Fruits Cultivation to Net Irrigated Area of tahsil (in %)		Difference 2010-11 to 1995-96 (In %)
	1995-96	2010-11	1995-96	2010-11	1995-96	2010-11	
Akkalkot	666	1051	549	891	7.15	6.30	-0.85
Barshi	1651	1704	1565	1608	15.17	11.37	-3.80
Karmala	154	827	107	793	1.15	2.85	1.70
Madha	1933	2314	1692	2259	13.63	4.68	-8.95
Malshiras	706	3015	706	2969	1.29	6.24	4.95
Mangalwedha	544	803	516	785	6.15	8.32	2.17
Mohol	1492	2085	1468	1978	18.14	8.76	-9.38
Pandharpur	1797	9525	1788	9516	3.64	14.24	10.60
Sangola	3768	8861	3702	8657	19.31	17.87	-1.44
Solapur (N)	729	589	398	527	23.15	10.35	-12.80
Solapur (S)	317	1154	314	1113	7.33	11.17	3.84
District	13757	31928	12805	31097	6.92	9.89	2.97

Total fruits cultivation area was about 13,757 Ha in the district where about 12,805 Ha area was under irrigated area which accounts about 6.92% to net irrigated area in 1995-96. Very high proportion of irrigated fruits cultivation area to net irrigated area is in Sangola tahsil i.e. > 25.88%; moderate in Madha, Pandharpur, Barshi & Mohol tahsil i.e. 10.56 to 18.22%; low share in

Solapur (N), Malshiras, Akkalkot, Mangalwedha tahsil i.e. 2.99 to 10.56% and very low in Solapur (S), Karmala tahsil i.e. < 2.99% to tahsil NIA.

Total fruits cultivation area was about 31,097 Ha in the district where about 31,928 Ha area was under irrigated area which accounts about 9.89% to net irrigated area in 2010-11. Very high proportion of irrigated fruits cultivation area to net irrigated area is in Pandharpur, Sangola tahsil i.e. > 17.99%; moderate in Malshiras tahsil i.e. 9.29 to 13.64 %; low share in Madha, Mohol, Barshi tahsil i.e. 4.94 to 9.29 % and very low in Solapur (S), Akkalkot, Mangalwedha, Solapur (N), Karmala tahsil i.e. < 4.99% to tahsil NIA.

About 18,171 Ha area under fruits cultivation was increased in the district from 1995-96 to 2010-11. About 2.97% proportion of irrigated fruits cultivation area to net irrigated area has been increased in the district.

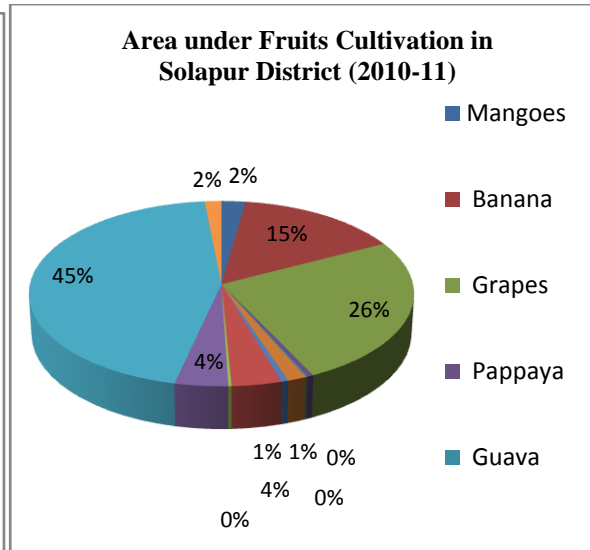
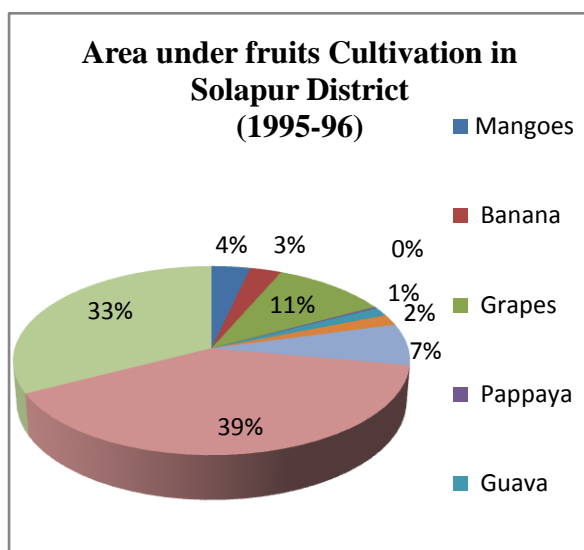
## 2) Area under Fruit Cultivation in Solapur District.

Table No. 2 :- Area under Fruit Cultivation in Solapur District.

Area under Fruit Cultivation in Solapur District.							
Fruits	1995-96		Changes in 1995-96 to 2010-11		2010-11		Fruits
	HA	% to TFCA	Hectares	% to TFCA	HA	% to TFCA	
Mangoes	492	3.57	216	-1.36	708	2.21	Mangoes
Banana	403	2.92	4425	12.20	4828	15.12	Banana
Grapes	1471	10.70	6654	14.74	8082	25.31	Table Grapes
					43	0.13	White Grapes
Papaya	36	0.26	115	0.21	151	0.47	Papaya
Guava	203	1.48	-155	-1.33	48	0.15	Guava
Chikku	255	1.85	210	-0.40	465	1.45	Chikku
Citrus Fruit	972	7.07	439	1.77	29	0.1	Orange & Kinu
					163	0.51	Mosambi
					1217	3.81	Lemon & Acid Lime
					2	0.00	Other Citrus fruit
Other Pome Fruits	5440	39.54	85	-39.29	57	0.17	Watermelon
					28	0.08	Muskmelon
Other Fruits	4485	32.60	11622	17.83	1296	4.05	Ber
					14319	44.84	Pomegranate
					492	1.54	Other fruits
<b>Total Fruits</b>	<b>13757 Ha</b>		<b>18171 Ha</b>		<b>31928 Ha</b>		<b>Total Fruits</b>
<b>Proportion of All Fruits to TCA</b>	<b>1.33</b>		<b>1.09</b>		<b>2.42</b>		<b>Proportion of All Fruits to TCA</b>

In 1995-96, total fruits cultivation area was about 13,757 Ha which accounts about 1.33 % cropped area to the total cropped area. It seems that, out of total fruits cultivation area (TFCA), other pome fruits accounts about 39.40% share; other fruits constitutes 32.60% area ; grapes constitute about 10.70% area; citrus fruits constitutes about 7.07%; mangoes constitutes about 3.57%; banana constitutes 2.92%; chikku constitutes about 1.85% ; guava constitutes about 1.48% and papaya constitutes 0.26% area in the district.

In 2010-11, total fruits cultivation area was about 31,928 Ha which accounts about 2.42 % cropped area to the total cropped area. It seems that, out of total fruits cultivation area (TFCA), pomegranate accounts about 44.84% area; table grapes constitutes 25.31% area ; banana constitute about 15.12% area ; ber constitute about 4.05 % area; lemon & acid lime constitutes about 3.81%; mangoes constitutes about 2.21%; banana constitutes 2.92%; chikku constitutes about 1.41% ; mosambi constitute about 0.51 % ; papaya constitutes 0.47% ; guava constitutes about 0.15% area in the district.



In the investigation period of study, it seems that the fruit cultivated area has been increased by 18,171 Ha in the district and accounts about 2.42% area to gross cropped area in 2010-11. There is a positive and negative changes takes place in fruits cultivated area in the district. There is a positive changes takes place by about 14.74% under *Grapes*; about 17.83% under other fruits; about 1.77% under *citrus* fruits and about 0.21% under papaya in district. There is a negative changes takes place by about 39.29% under *other fruits*; about 1.83% under *mangoes*; about 1.33% under guava fruits and about 0.40% under *chikku* in district.

#### Conclusion :

- 1) There has been increased about 18,171 Ha under fruits cultivation in the district.
- 2) There is about 1.36 % negative changes takes place under mango cultivation in district.
- 3) There is about 12.20 % positive changes take place under banana cultivation in district.
- 4) There is a negative changes found under chikku, guava fruits in district.
- 5) There is a about 39.15% negative changes under pome fruits in district.
- 6) Area under pomegranate fruits has been increased by 44% and especially Pandharpur, Madha, Malshiras, Sangola, Mangalwedha tahsil are leading in district.
- 7) Mohol, Madha, Pandharpur, Sangola tahsil are leading in banana cultivation due to irrigation development.
- 8) Pandharpur, Solapur South tahsil are leading in grapes cultivation in district.
- 9) Sangola, Barshi tahsil are leading in chikku cultivated area while Mohol, Madha are in Ber cultivated area in the district.

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## Application Of Remote Sensing And Gis In Agriculture

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### Abstract:

*In India Agricultural field is highly changeable because of different in climate, soil and topography of different states. For agricultural management, all these factors need to be analyzed on Ariel basis. The new techniques in Geography like remote sensing and geographical information system can be of great use for their management. Remote sensing and GIS are very important tools having wide range of applications to solved various agricultural issues. These techniques are used in agriculture for crop discrimination, crop growth monitoring, crop inventory, soil moisture estimation, cropevaporate-transpiration, crop acreage estimation and yield prediction. Timely and reliable information on crop acreage, growth condition and yield estimation can be highly beneficial to the producers, managers and policy planners for taking decisions regarding food security and economic impact. Remote sensing and GIS can also be used very effectively in land use, land cover analysis as well as damage assessment because of drought, floods and other extreme weather events. This research paper has been made in the present study to reviewanalyses and evaluate the latest information regarding the application of remote sensing and GIS for crop monitoring, crop condition assessment and yield estimation for sustainability of agriculture.*

**Key words:**Geographical information system, remote sensing, crop discrimination, Crop acreage estimation, Crop growth monitoring, Crop yield prediction.

### Introduction:

Agriculture plays dominant role in economy of India. During the last two decades remote sensing and GIS techniques are applied to explore agricultural applications. Global warmingeffect the sustainability of agriculture in many regions over the earth's surface. Significant rise in extreme weather events has been observed globally in the recent past. Global warming triggered climatic changes and extreme weather events have a significant impact on agriculture. Today becauseof changingclimatic conditions, crops have to suffer from different types of stresses leading to reduced crop productivity and year to year variability. Because of that remote sensing and GIScan be of great help for crop growth monitoring, identification and management of different types of stresses and regional yield estimations to sustain the natural resources and agricultural productivity.

In Indian agriculture there are small landholdings, inadequate resources and lack of agro-technological information. Under the changing climatic scenarios, agricultural planning and use of agricultural technologies need precise spatial-temporal meteorological and crop information for accurate data analyses, forecasts and their effective application in agriculturalPlanning and management decisions, irrigation and scheduling.

### Remote Sensing And Gis Techniques:

Although the conventional methods of acquiring weather and crop growth status information are reliable, but they are labour intensive and time consuming. However, recently remote sensing (RS) and geographical information system (GIS) technologies are gaining importance for acquiring spatial-temporal meteorological and crop status information for complementing the traditional methods. Under the changing climatic conditions, quick spatiotemporal assessment of extreme weather events and crop growth status including crop stress detection and damage assessment is difficult using conventional methods. Under such conditions, geospatial technology i.e. remote sensing and GIS are highly applicable for acquisition and management of huge spatial-temporal data by using satellite information, digital maps and simulation models etc. This technology is highly advantageous because of rapid and repetitive data availability, quick analysis and generation of valuable information for decision-makers and policy planners.

1. Remote sensing technology has the potential of revolutionizing the detection and characterization of agricultural productivity based on biophysical attributes of crops.
2. Data recorded by remote sensing satellites can be used for yield estimation, acreageestimation, crop phonologicalinformation, detection of stress situation and disturbances.
3. Remote sensing provides a cheap alternative for data acquisition over large geographical areas
4. Remote sensing along with GIS is highly beneficial for creating basic informative layers and generating valuable integrated information by superimposing different basic layers.



5. This technology can be successfully applied to diverse fields including floodplain mapping, hydrological modeling, and surface energy flux, urban development, land use changes, crop growth monitoring.
6. Today, remote sensing is potentially a practical management tool for site-specific crop management in precision agriculture.

### **Application Of Rs And Gis In Agriculture:**

#### **1. Spectral Reflectance**

The basic concept of data acquisition through remote sensing revolves around the spectral reflectance characteristics of different surface features. The advent of multispectral and hyper spectral remote sensing technology has widened its applications in different fields. These technologies are highly applicable in agriculture because multispectral reflectance and temperatures of the crop canopies are related to two important plant physiological processes i.e. photosynthesis and evapotranspiration. Chlorophyll pigment absorbs mainly in the Blue and Red part of the electromagnetic spectrum and reflects the green. The percentage of radiation reflected from the leaf is higher in the NIR than in the green. The spectral behavior of the leaf changes during senescence and in plants subjected to stress by reflecting more red light and absorbing more NIR. Opposite behavior is shown in healthy plants with high values of reflectance in the NIR region and low values in red

#### **2. Crop Inventory**

The science of remote sensing can play a pivotal role in crop identification and area estimation and, therefore, has a significant role in inventorying data base on different crops. A number of studies using aerial photographs and digital image processing techniques have been reported in literature. It helps in reducing the amount of the field data to be collected and provides higher precision of the estimate. Grazing intensity categories were defined based on percentage of bare soil, sward height and standing dead material. Correlation analysis between spectral ratio, i.e. Normalized Difference Vegetation Index (NDVI) and above ground biomass was significant.

#### **3. Physiological Studies**

These studies indicated the potential use of vegetation spectral indices derived from various scales of remote sensing data for determining plant physiological properties and improving estimates of plant physiological and structural characteristics from hyper spectral data, allowing for much more detailed spectral analyses and hence more accurate estimates. Remote sensing data have been exploited to estimate canopy characteristics by using empirical approaches based on spectral indices estimated using hyper spectral imagery. These studies investigated the spectral reflectance properties of the plants, identifying key spectral wavebands related to specific plant physiological and structural characteristics, hence deriving sensitive vegetation spectral indices for their non-destructive estimation. Analysis of hyper spectral remote sensing data has been carried out to estimate LAI for agricultural crops and forests.

#### **4. Monitoring Of Vegetation Status**

Remote sensing of soil and crop can be an attractive alternative to the traditional methods of field scouting because of the capability of covering large areas rapidly and repeatedly providing spatial and temporal information necessary for sustainable soil and crop management. The potential of remote sensing in agriculture is very high because of its ability to infer about soil and vegetation cover as a non-destructive mean. Numerous spectral vegetation indices have been developed to characterize vegetation canopies. A most significant intellectual challenge to ecologists and bio-geographers is to understand spatiotemporal patterns of vegetation.

#### **5. Precision Agriculture**

Remote sensing technology is a key component of precision farming and is being used by an increasing number of scientists, engineers and large-scale crop growers. Precision farming aims at reduced cost of cultivation, improved control and improved resource use efficiency through information received by the sensors fitted with the farm machineries. Variable rate technology is the most advanced component of precision farming. Sensors are mounted on the moving farm machineries containing a computer which provides input recommendation maps and thereby controls the application of inputs based on the information received from GPS receiver

#### **6. Nutrient And Wsm**

Nutrient and water stress management is one of the most important fields where we can opt for application of remote sensing and GIS through the application of precision farming. Detecting nutrient stresses using remote sensing and GIS can help in site specific nutrient management and thereby can reduce the cost of cultivation as well as increase the fertilizer use efficiency. In the semi-arid and arid regions, judicious use of water can be possible through adaptation of precision technologies. Development

in remote sensing data acquisition capabilities, data processing and interpretation of ground based, airborne and satellite observations have made it possible to couple RS technologies and crop management systems to improve nutrient and water use efficiency.

### **7. Pest Infestation**

Remote sensing approach in assessing and monitoring insect defoliation has been used to relate differences in spectral responses to chlorosis, yellowing of leaves and foliage reduction over a given time period assuming that these differences can be correlated, classified and interpreted. The range of remote sensing applications has included detecting and mapping defoliation, characterization of pattern disturbances etc. and providing data to pest management decision support system. Remote sensing technology as an effective and inexpensive method to identify pestinfested and diseased plants. They used remote sensing techniques to detect specific insect pests and to distinguish between insect and disease damage on oat.

### **8. Weed Identification And Management**

Based on the variation in spectral reflectance characteristics of weeds and crops, remote sensing technology provides a means of identification of weed infestation in the crop stand and further aids in the development of weed maps by detecting the location of weeds within an agricultural field, so that site-specific/need based herbicide can be applied. Higher radiance ratio and NDVI values in solid stand or pure wheat and minimum under solid weed plots.

### **9. Flood Effect On Agriculture**

Satellite remote sensing allows timely investigation for large regions and provides frequent imaging of the region of interest. Until recently, near real-time flood detection was not possible, but with sensors such as Hyperion on board the EO-1 satellite, this has been significantly improved. Automated spacecraft technology has reduced the time to detect and react to flood events in a few hours. Advances in remote sensing have resulted in the investigation of early warning systems with potential global applications. Detected flooded areas with satellite data and investigated moisture classes in flood plain areas in relation to water changes, accumulation of sediments and silts for different land-use classes and erosive impacts of floods.

### **10. Evapo-Transpiration**

Evapotranspiration is essential for water resource management such as water and energy balance computations, irrigation scheduling, reservoir water losses, runoff prediction, meteorology and climatology (Medina et al., 1998). Estimation of spatial variability in evaporate-transpiration is possible over a wide area by using remotely sensed information coupled with surface energy balance algorithms. The energy emitted from cropped area has been proven beneficial in assessing crop water stress as the temperature of most plant leaves are mediated by soil water availability and crop evapo-transpiration

### **11. Climate Change**

Understanding and forecasting climate change a challenging task. The climatic conditions on the earth have been and will ever be changing. Amid the dire warnings of severe weather perturbations and global warming, scientists and policy makers have been searching for ways to tackle the threats of climate change. For climate change analysis, remote sensing is a required tool for up-to-date environmental data acquisition both at local and synoptic levels

### **Conclusion**

Remote sensing and GIS application of agriculture expanded into different domain. With availability of SAR sensors monitoring of crop during kharif season become a reality. India is dominant country in agricultural application of remote sensing and has carried out capacity building by Indian scientist. The agro ecosystems analysis and climatic change impact would be the focal theme in which variety of components can come from remote sensing data. The Remote sensing and GIS communications technologies would use in the future to deliver the service to all stockholders of agriculture. The application of Remote sensing and GIS in agriculture is extremely complex, However, this technology provides many advantages over the traditional methods in agricultural resources survey.

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## Changing Cropping Pattern Of Major Cereal Crops In Upper Krishna Basin Of Maharashtra: A Geographical Study

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### Abstract

*Agriculture is the science and an art of cultivation of crops and the raising of livestock and is not only a made of livelihood but also a way of life. The agriculture provides food and non food crops to the human beings. Considering this view present study concentrate on changing cropping pattern of cereals crops in Upper Krishna Basin of Maharashtra. Present Investigation is based on Secondary data abstracted through Socio-economic Review and District Statistical Abstracts of Sangli, Satara and Kolhapur District for the period of 1994-95 and 2012-13. The change in percentage is calculated for calculating volume of change for above period. The change in cropping pattern is displayed through table whereas maps are prepared for presenting spatial change in cropping pattern. It is observed that the area under Jawar in the decade is decreased by 4.07 per cent. No change in percentage is observed in rice cultivation.*

**Key Words:** Cropping Pattern, Temporal Change, Agriculture, Spatial Change, Cereal Etc.

### 1.1 Introduction:

Two major problems facing India today are directly concerned with agriculture. The first is meeting the escalating demand for food and other agricultural product by ever increasing population. The later is reducing the wide spread poverty in rural areas because performance in agriculture is inversely related to the levels of rural poverty. Pattern of crop land use of region are manifestation of combined influence of physical and human environment. Differences in attitude towards the rural land in the level of prosperity and technology have produced change in emphasis. Their effects on both landscape and land use studies are likely to be far reaching (Coppock, 1968). Cropping pattern means the proportion of area under different crops, the rotation of crop and area under double cropping in a region or in a country (Singh and Sadhu, 1986). Cropping pattern means the proportion of area under various crops at a point of time. It is however, a dynamic concept as it changes over space and time. The cropping pattern of a region is closely influenced by the geo-climatic, socio-cultural, economic, historical and political factors (Husain, 1996). The cropping pattern is influenced by the physical factors such as soil, climate; technological factors like irrigation, improved varieties of seeds, availability of fertilizers, and plant protection chemicals; institutional factors like land reform, consolidation of holdings, credit facilities, price structure, procurement policies, and storage facilities (Shafi, 2006). The analysis of the cropping pattern is necessary for an identification of the major crops that are grown in the district or in the region by its farmer. The farmers generally produce two types of crops viz. a) Food crops and b) Commercial crops or non-food crops. The study of these two would important to measure the agriculture development and the nature of the economy. Natural, changeable like economic, social, personal and government policies are affecting on cropping pattern to the entire region. Cropping pattern of a particular place is very much influenced by nature of soil, climatic condition, farm size, prices, export taxes, modern technology and subsidies. The major cropping pattern in Upper Krishna Basin introduced 'Kharif' which includes Rice, Bajara, Jawar, Maize, Oilseeds etc. and post monsoon crops or 'Rabi' included Wheat whereas, Gram can also be considered to be the base crops for describing the cropping patterns.

### 1.2 Objectives:

1. To study the changing cropping pattern of the study region.
2. To analyze decadal spatial change in major cereal crops like Jawar, Rice, Wheat and Bajara.

### 1.3 Database And Methodology:

Present study is based on secondary data abstracted through Socio-economic Review and District Statistical Abstracts of Sangli, Satara and Kolhapur District for the period of 1994-95 and 2012-13. The change in percentage is calculated for calculating volume of change for above period. The temporal change in cropping pattern is displayed through table whereas maps are prepared for presenting spatial change in cropping pattern.

### 1.4 Study Area:

Upper Krishna Basin comprises the southern part of Maharashtra State covering an entire area of Kolhapur district and part of Sangli and Satara district. It lies between 15<sup>o</sup> 49' North and 18<sup>o</sup> 2' North parallels and 73<sup>o</sup> 33' East and 74<sup>o</sup> 58' East meridians comprises 28 tahsils. The interstate boundary between the states of Maharashtra and Karnataka runs in the south and southeast directions. The western boundary is well defined by the Western Ghats in Ratnagiri and Sindhudurg District and the region under study. The region covers an area of 20, 97439 sq. kilometers (i.e.6.81 per cent of the state) and includes supports 8377059 people (2011), which is about 7.45 per cent of the Maharashtra state's population. The river Krishna with its tributaries drains the entire region. Within the study area it flows for a distance of about 364-Kilometers of its total course of 1280 Kilometers.

### 1.5 Temporal Changes In Cropping Pattern:

The cropping pattern for the period of 1990-91 and its temporal change in next decade 2000-01 is shown in table 1.1 the table shows that, the change in gross cropped area is observed up to ± 21.68 per cent to the previous decade for various crops. The positive change is observed up to 5.95 per cent in double cropped area because the farmers are taking double crops in their farms for additional income. The change in Pulses (2.18 %), Fruits and vegetables (2.37 %), oil seeds (2.09%), Fodder crops (1.98 %), and non food crops (4.48 %). The area under cereals is decreased up to -3.18 per cent. It is observed that the area under Jawar is decreased up to -4.08 per cent, Bajara (-1.86 %) and rice (-.12 %). The temporal change in cropping pattern shows that, the farmers in Upper Krishna Basin are attracted towards commercial farming instead of subsistence agriculture.

**Table No. 1.1**

**Upper Krishna Basin: Temporal Changes in Cropping Pattern.**

Sr. No.	Crops	1990-91		2000-01		Percentage of volume change 1990-91 to 2000-01
		Area in Hect.	Percentage to Gross cropped area	Area in Hect.	Percentage to Gross cropped area	
1	Rice	157706	10.67	168200	10.54	-0.12
2	Wheat	46167	3.12	56464	3.54	0.42
3	Jawar	376956	25.49	341659	21.42	-4.08
4	Bajara	88629	5.99	66017	4.14	-1.86
5	Other cereals	19020	1.29	7484	0.47	-0.82
6	Total cereals	728583	49.28	735285	46.10	-3.18
7	Total pulses	139593	9.44	185356	11.62	2.18
8	Total food grain	868176	58.72	920641	57.72	-1.00
9	Sugarcane	148497	10.04	179954	11.28	1.24
10	Spices	14076	0.95	11958	0.75	-0.20
11	Fruits & Vegetables	26049	1.76	65945	4.13	2.37
12	Total food	1098808	74.31	1113998	69.84	-4.48

	crops					
13	Total fibers	1883	0.13	2678	0.17	0.04
14	Total oil seeds	247668	16.75	300537	18.84	2.09
15	Total fodder crops	123065	8.32	164300	10.30	1.98
16	Miscellaneous	225	0.02	15212	0.95	0.94
17	Total non food crops	379776	25.69	481127	30.16	4.48
18	Net sown area	1239386	83.82	1242178	77.87	-5.95
19	Double cropped area	239198	16.18	352947	22.13	5.95
20	Gross cropped area	1478584	100.00	1595125	100.00	<b>±21.68</b>

Source: Based on Socio-economic Review and District Statistical Abstracts of Sangli, Satara and Kolhapur District. (1994-95 and 2012-13).

### 1.6 Spatial Change In Major Cereals Crops:

#### 1.6.1 Jawar:

This crop is cultivated in both seasons namely *Kharip* and *Rabbi*. The requirement of rainfall is below 70 cm. Jawar is a major food crop of the Upper Krishna Basin about 25.49 per cent of the gross cropped area is covered by jawar in 1990-91, which is 21.42 per cent in 2000-01. In the year 1990-91 the tahsil like Tasgaon has recorded about 12.30 per cent area under jawar followed by Koregaon (10.93%), Khanapur (10.19%), Satara (9.87 %), Karad (7.34%) and Khatav (7.31%). This pattern is changed in the year 2000-01 (Fig.1.1 A & B). The Khanapur is leading in percentage of area under jawar and noted about 14.7 % area followed by Tsagaon (12.69), Miraj (9.29%), Satara (8.71%), Koregaon (8.57) and Kavthemahankal (7.08%) respectively in the eastern part of the region.

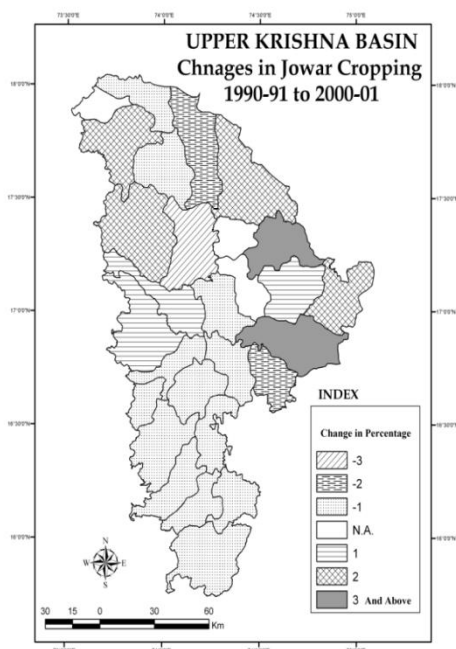


Fig.1.1 A

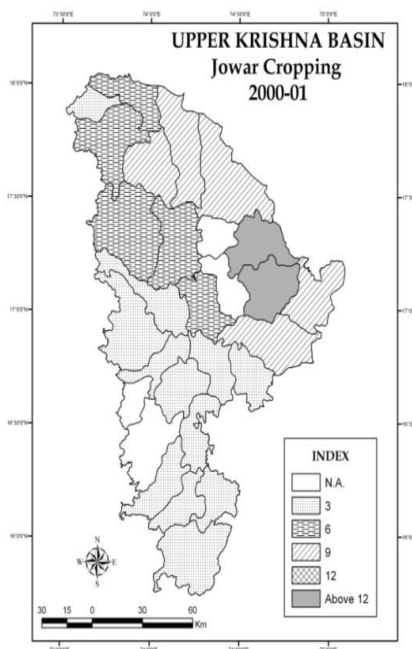


Fig.1.1 B



### 1.6.2. RICE:

Being a tropical monsoon crop, it requires temperature of 21° C during sowing and 37°C during harvesting. It requires high Rainfall or assured irrigation facilities (Pawar, 1989). It is grown in the areas of having annual rainfall above 150 cm. Rice is considered as a staple food of the India. It is second ranking crop in the region. This is also considered as a traditional staple food crop of the region. Rice is the crop requires high Rainfall or assured irrigation facilities. In western and central part of the region high rainfall and assured water facilities are available for rice cultivation in the region.

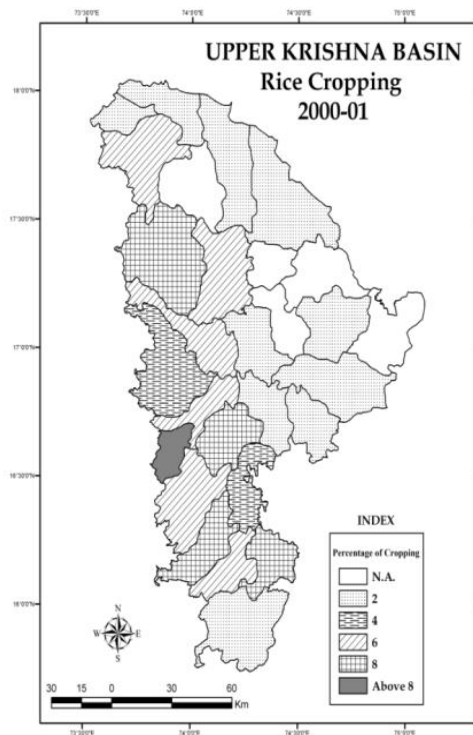


Fig. 1.2 A

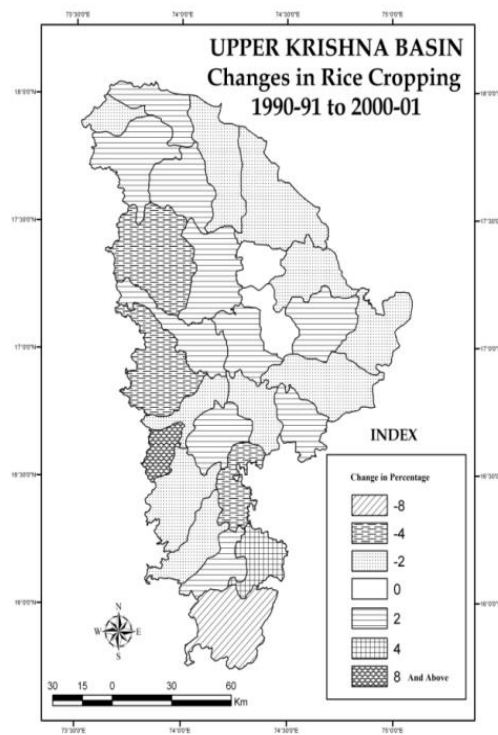


Fig. 1.2 B

The rice occupies about 10.67 per cent area in 1990-91 whereas, 10.54 per cent in 2000-01 (Fig. 1.2 A & B). During 1990-91 the taluk Patan occupies about 10.05 per cent area under rice cultivation followed by Chandgad, Bhudargad, Shahuwadi, Karveer, Radhanagri, Kagal (6.83 %) and Shirala (5.95 %), respectively. In year 2000-01 the Gaganbawda (9.27) followed by Patan (8.81 %), Gadhinglaj (8.49 %), Karveer (7.80 %), Bhudargad (7.13 %), Shirala (6.80 %), Radhanagri (6.63%), Panhala (5.56 %) and Ajara (5.54 %) respectively.

### 1.6.3 Wheat:

Wheat is a *Rabbi* crop which requires winter season and required temperature between 10°C to 15°C for sowing and about 25°C to 35°C at the time of harvesting. It requires irrigation facilities in the eastern taluks where receives less than 500 mm. of rainfall. The wheat cultivation is mainly observed in two pockets i.e. eastern Zone- comprising Miraj, Tasgaon, Khanapur, Kavatemankal and Shirala whereas, north western part comprising walwa, Bhudargad, Gadhinglaj taluks. The wheat occupies about 3.12 per cent areas against total gross cropped area in 1990-91 which is went up to 3.50 per cent in 2000-01.

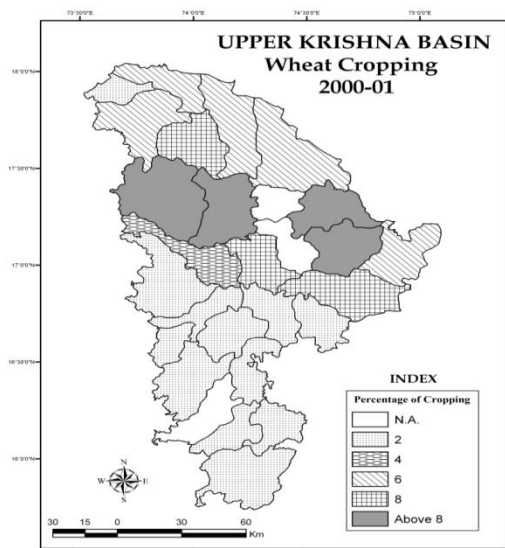


Fig.1.3 A

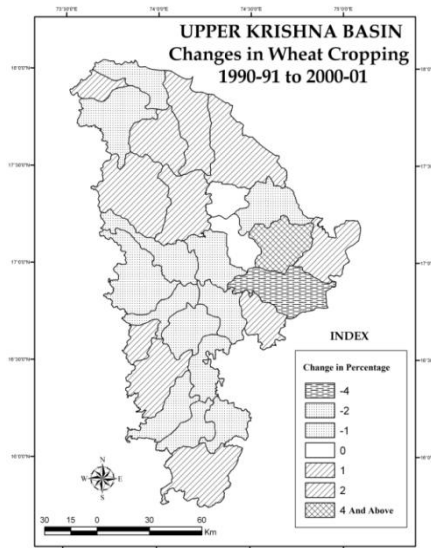


Fig.1.3 B

In 1990-91 Miraj ranks first and occupies 11.50 per cent area under wheat cultivation followed by Khanapur, Walwa, Patan, Karad and Wai. The Satara, Tasgaon and Khatav tahsil (Fig.1.3 A & B). It is observed that excluding Chandgad and Gaganbawada wheat cultivated in whole of the region. In 2000-01 Tasgaon has occupies large area and contributed 9.57 per cent under wheat cultivation followed by Patan (9.34%), Khanapur (8.16%), Karad (8.03%), Satara (7.08%), Walwa (6.83%), Miraj (6.82%), Wai (5.62%), Khatav (5.14%) and Jawali (4.09%) respectively.

**1.6.4 Bajara:**

Bajara is considered as a drought resistant variety of crop requires less amount of the rainfall (25 cm to 45 cm). In eastern drought prone tahsils it has significant contribution. The eastern tahsils like Khanapur, Miraj and Kavthemahankal, Tasgaon, whereas north eastern tahsils like Khatav and Koregaon has large area under Bajara. It occupies about 5.99% area in 1990-91 and about 4.14% in 2001. The area under Bajara has decreased by 1.85% during this decade.

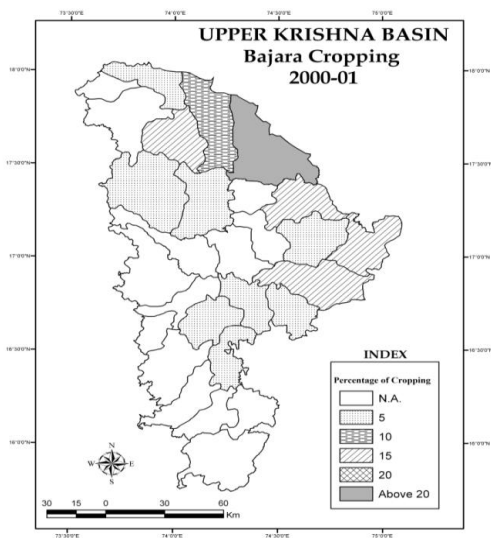


Fig.1.4 A

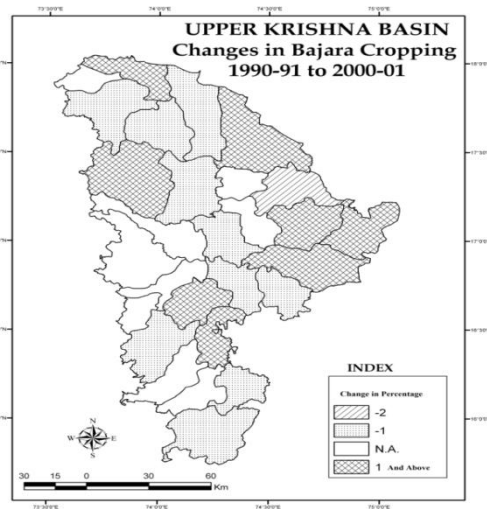


Fig.1.4 B

This is confined to Khanapur, Koregaon, and Kavthemahankal tahsils. It is largely due to H.Y.V. of Jawar. In 1990-91 Khatav occupies 49.69% of area under Bajara followed by Khanapur (13.16%), Miraj (11.79%), Koregaon (7.88%), Wai (1.65%), and Tasgaon (1.01%) has significant contribution where as west of the region has insignificant contribution in respect of Bajara (Fig.1.4 A & B). In 2000-01 Khatav has leading with significant contribution with 51.05% followed by Kavthemahankal (13.78%), Miraj (12.51%), Khanapur (11.10%), Koregaon (6.54%), Wai (2.40%) and Tasgaon (2.14%) respectively.

### 1.7 Conclusion:

Jawar is the major cereal crop in the region followed by rice wheat and bajara. Being a major food crop in the Maharashtraian diet farmers of the region are cultivated jawar in kharip and also in rabbi season. It is observed that the percentage of area under jawar is decreased in the study period due to erratic nature of Monsoon and drought like situation in the region. The north eastern and eastern tahsils are dominated by jawar cultivation in the region due to the lowest rainfall.

Rice is second most dominated cereal crop in the western tahsils of the region. Though the western part of the region receives heavy rainfall provides healthy environment for cultivation of rice in the region. Rice is followed by wheat which is cultivated in rabbi season along to the river and irrigated area in the central part of the region and also in surrounding areas due to the irrigation facilities.

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## **The Role Of Ict(Information Communication Technology) In The Rural Development Of India.**

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### **Abstract**

*Information Technology (IT) or Information Communication Technology (ICT) generally refers to the computer based telecommunication. It is an electronic system for receiving, processing, transmitting and storing information with the help of the INTERNET. Vast use of ICT with proper guidance helps to create information rich society. The recent growth and spread of ICT in is very useful and supplementary to rural development in India. ICT has an advantage of interactivity with higher speed in reasonable depth, minimum expenditure and with meager time. Thus with the help of ICT, peoples living in rural areas can uplift their quality of life and economic base. The main objective of the present paper is to introduce with the present role of ICT in the rural development and suggest some remedial measures for further improvement in the future. ICT will reduce the dependency of rural peoples in so many sectors and provide a chain of extensive systems. ICT offers number of opportunities the number of sectors to enhance existing services. It enables the access of information related to agriculture, small-scale industry, education, health, employment, market, government records and documents. At the end along with the limitations and remedial measures some concluding remarks are made.*

### **Key Words**

ICT-Information Communication Technology, Rural development, Globalization, Internet, Rural Health, Rural Education, Rural poor's, Rural Areas, Entrepreneur, E-governance, Telecommunication, Government and Non-government Agencies etc.

### **Introduction**

The process of rural development is related to economic wellbeing and improvement in the quality of life of peoples in the rural area with an increasing attention of the world. India is a second most populated country of the world with six lakh villages and 67% rural population. It is struggling to live and to progress in the globalization along with the traditional occupation of agriculture. For the overall progress and development of rural population, rural development with ICT (Information Communication Technology) is of vital importance. This type of development always considers social, cultural, economic, environmental and spatial aspects in the contemporary scenario of the WORLD.

The development tend to keep working in discrete sectors of economy i.e. agriculture, industry, transport, infrastructure along with social, cultural, economic and educational sectors. Rural population comprises of the social, cultural and economic constraints of the society along with the lager's, poor's, displaced, deprived and excluded sections of the region. Information Technology (IT) or Information Communication Technology (ICT) generally refers to the computer based telecommunication. It is an electronic system for receiving, processing, transmitting and storing information with the help of the INTERNET. Vast use of ICT with proper guidance helps to create information rich society. The present traditional systems are unable to communicate the quantum of complex and diverse information for the peoples in rural areas. The recent growth and spread of ICT in is very useful and supplementary to rural development in India. ICT has an advantage of interactivity with higher speed in reasonable depth, minimum expenditure and with meager time. Thus with the help of ICT, peoples living in rural areas can uplift their quality of life and economic base.

### **Objective**

The objective of rural development through ICT is not restricted to any single department but spread over several mix services to raise agricultural and industrial output, create new employment, improve health and education and expand communication. The main objective of the present paper is



to introduce with the present role of ICT in the rural development and suggest some remedial measures for further improvement in the future. The present paper is an outcome of general reading of references, newspapers and reactions on social media.

### **Infrastructure For Ict Use**

To provide ICT services in the rural areas, a basic infrastructure is very essential. It includes working stations, high-speed network, display and interactive devices, printers etc. For geographically remote areas like mountains, deserts, forests and islands there is a need of mobile working station, laptop, tablet, notebooks and wireless network. The working stations must have focused coverage and public access. It aims to provide services at free or minimum cost along with convenient and accessible locations at walking distance. Technical support is also of vital importance in the field of ICT infrastructure. Knowledgeable and technical support staff must be recruited, which will solve the problems of rural people.

### **Need Of Ict In The Rural Development**

Generally, in the rural areas people depend on government and non-government agencies for obtaining information. In this situation people in the rural areas may not get adequate information in proper way and in wright time. ICT will reduce the dependency of rural peoples in so many sectors and provide a chain of extensive systems. ICT offers number of opportunities the number of sectors to enhance existing services. It enables the access of information related to agriculture, small-scale industry, education, health, employment, market, government records and documents. ICT can play a significant role in eradicating poverty and uplifting living standard with information rich society. ICT can easily reach the peoples in geographically remote areas like mountains, deserts, forests etc. ICT can provide a wide variety of information with the pertinent option of selection to specific need and situation. One of the key attribute of ICT is the availability by 24 hours a day.

### **Sectors Of Rural Development Through Ict**

ICT means the way we use information and the way we communicate information. There are some areas where ICT could play an important role in the rural development. Education is a backbone of nation even though large number of students is not a part of this system. Geographical location, socio-economic conditions, poor transport facilities, inadequate infrastructure could be the reasons. To washout this mismatch we have to adopt ICT techniques in education. ICT enables students to self-learning, interactive partition and facilitate the information and knowledge. Rural health is the most neglected sector in this country. More attention is needed to improve the access of health services especially to the rural women and children. There are number of health related plans for rural areas but the major issue comes at proper planning, implementation and adequate infrastructure. The total expenditure on health is very low in India which is marginally increased over the years. This sector still suffers from underfunded and poor governance. Recently government initiated a health program under the Digital India Program to improve health facilities. It covers online consultation, records, medicine and patient information. Despite this, ICT has made vital impact on rural health, as it improved accessibility, affordability, availability of health services especially in remote areas.

India primarily is an agrarian country and agriculture is a main stay of majority population. The share of agriculture in the GDP (Gross Domestic Production) is declined significantly; still it represents the largest opportunities in terms of employment. Due to its subsistent nature and traditional practices, farming is still not taken as a business or commercial activity. Use of ICT can change the scenario of Indian agriculture. Indian Metrological Department is using ICT techniques and stimulating very needed accurate information to the farmers. With the use of ICT one can able to find out information about HYV seeds, chemical and organic fertilizers, soil and plant properties, dairy, poultry and piggery, market related information, storage facilities, government policies, planning and management techniques etc. NGO's are also helpful with ICT techniques which have made a significant difference to agricultural operations. Sound decision making is depend on timely,



update and comprehensive information which is possible only through ICT. Through ICT farmers could promote their products, handle transactions of order and payment very smoothly. Online transactions are very cheaper, faster, easier, time saving, paperless and open to national and international markets.

ICT can empower rural population and permits them to contribute to the development process. These peoples can interact with families, friends, neighbors, suppliers, customers and intermediaries which is helpful to educating the mass rural population. Through ICT centers at village level employment opportunities like managers, experts, operators, translators, cleaners and watchmen's can be created. These centers also work as training centers for other peoples and became a small scale entrepreneur's. Overcrowding and mass gathering also eliminated through the use of ICT at various government and non-government offices. ICT has a potential to support the needs of remote rural peoples through its multiple channel operations. It built interactive infrastructural framework which lead to smooth functioning of financial operations. Along with the government agencies commercial and co-operative banks, micro finance institutions also considers these innovative practices and reduce high operating costs and time. ICT applications are time saving, power saving and could use to improve transferability and accountability. ICT nowadays has emerged as a key element, which can drive and accelerate the growth and development of rural regions. Along with ICT e-governance is a complimentary government service, which proved very helpful in the rural development. It involves computerization of facilities and services provided by the central and state government to the local citizens of that rural area. It also involves the computerization of government records, documents and various reports. E-governance is proved very useful and beneficial in implementing various schemes of government related to subsidies, weather forecasts, employment, voting etc. it is very helpful in collecting information of various subjects and blur the boundaries of different government departments. E-governance through ICT eliminates the discretionary powers and makes transitions transparent and accessible to one and all.

#### **Application Of Ict At Village Level**

Application of e-governance and ICT is very possible through ICT centers at circle villages or tehsil villages in the rural areas. Experiments of M S Swami Nathan Research Foundation (MSSRF) Chennai, Information Village of MANAGE in Rangareddy district of Andhra Pradesh, Gyandoot net initiative of Dhar district of Madhya Pradesh, Warna wired village project in the Kolhapur district of Maharashtra, Amul co-operatives in Anand district of Gujrat are some good examples of ICT enabled rural development projects in India. Central Government, State Government and WarnaVibhagShikshanMandal jointly started this project. The project incorporated seventy villages around Warnanagar. It is especially developed to increase the efficiency and productivity of co-operative enterprises. It provides agricultural, educational, medical information along with the government plan and policies. It also provides communication facilities to the villages which are linked with the Warna co-operative complex. Another example is Amul co-operatives in Gujrat, which is farmer owned. It is a renowned model of dairy development project of India. Under this project more than five thousand milk collecting centers are linked through ICT. It gives accurate information to the farmers about quantity and quality of milk along with the fat content. The elimination of manual registers ensures fast, error free transactions. ICT considerably improved delivery system, payment system and eradicate the process of malpractice and corruption.

#### **Limitations In The Application Of Ict In The Rural Development**

Role of ICT in the rural development is of vital importance and the steps are also taken in that direction by the government and non-government agencies in recent years. But there are some general problems that have been experienced at grass root level in the implementation of ICT based rural development projects. After more than seventy years of Indian independence more than eighty-six croreie 35.70% population is still illiterate which is a fundamental hindrance in the ICT based rural

development. This illiterate mass population lack the basic skills required to harness the benefits of ICT. Telecommunication and electricity are the basic infrastructural facilities of ICT lacking remarkably in the rural areas. Inadequate wireless technology, low band width and high cost internet services also hampers the application of ICT in the rural areas. The language used in ICI is English, which is a major constraint in its development and spread. The users of ICT in rural areas are needed training in of use and application then they will became more confident and comfortable.

### Concluding Remarks

At the end we can say that in this modern era of science and technology the use of ICT and e-governance is a key to the rural development and it should be a life style of rural peoples. ICT can help the rural peoples through economic and social development along with the upliftment of standard of living. It enables the access of information related to agriculture, small-scale industry, education, health, employment, market, government records and documents. Along with the government the non-government agencies have to take the initiatives and implement the applied ICT projects in the rural areas. Every citizen of rural area should be incorporated in this mission along with the training of ICT skills which is useful for the employment opportunities and betterment of their life.

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## Agro-Tourism: Scope And Opportunities For The Farmers n Maharashtra, A Geographical Analysis.

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### Indroduction:

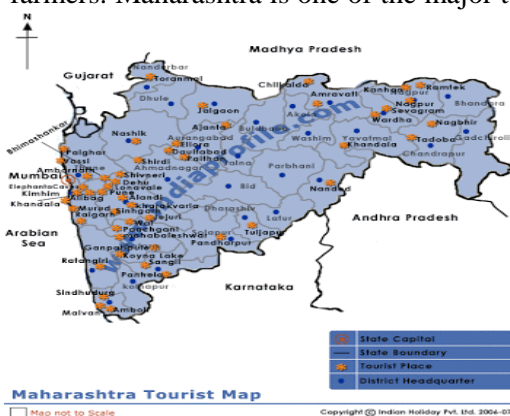
Agricultural tourism is a worldwide trend, which offers city dwellers a chance to escape urban concrete and re-discover their rural roots. Agricultural tourism is a relatively new market for tourists. The chance of interacting with individuals that one may not interact with on any level at any time involves the mystery that accompanies the occupation of this individual. The interaction of individuals with farm life also carries an educational aspect. People tend to enjoy learning about items and processes that they will not participate in directly. Agro-tourism or Agricultural tourism is becoming an important tourism development opportunities and more of the population have moved to the city and have lost their connection to where agriculture is produced "Agricultural Tourism" includes a set of economic and social activities that occur and link travel with the products, services, and experiences of agriculture.

Agricultural tourism is a type of tourism that has seen a boost in popularity within recent years. It allows people to stay at fully functioning farms in order to observe the work routines and activities that are undergone in the agriculture business on a day-to-day basis.

This is an excellent opportunity for many people to experience and learn about a lifestyle that is quite different than their own, often times in beautiful, peaceful, rustic settings.

Tourism is now well recognized as an engine of growth in the various economies in the world. Several countries have transformed their economies by developing their tourism potential. Tourism has great capacity to generate large-scale employment and additional income sources to the skilled and unskilled. Today the concept of traditional tourism has been changed. Some new areas of the tourism have been emerged like Agro-Tourism. Promotion of tourism would bring many direct and indirect benefits to the people.

Agro-tourism is an innovative agricultural activity related to tourism and agriculture both. It has a great capacity to create additional source of income and employment opportunities to the farmers. Maharashtra is one of the major tourist centers in the India and there is large scope and great potential to Develop agro-tourism.



### Objectives :

The objectives of this paper are follows:

1. To examine the importance of agro-tourism development in Maharashtra.
2. To define a suitable framework for the of agro-tourism centers in the view of marginal and small farmers.
3. To identify the problems of the agro-tourism

### Hypotheses :

The hypothesis of the study is: - the agro-tourism is an additional co-activity for the farmers. It provides additional income source and employment opportunity to the farmers and rural peoples. It gives new look for the agri-business. There is need of such types of activities in the Maharashtra.

### Importance Of The Study:

Agriculture is a most important occupation in the India including in the Maharashtra. But, today it has becomes unprofitable due the irregular mansoon, prices fluctuations of Agro-products and some internal weakness of the agriculture sector. Hence, there is need to do some innovative activities in the agriculture, which will help to farmers, rural peoples.

Urban population is increasing day by day in the Maharashtra, today the urban people's world is restricted in the closed door flats, offices, clubs, television, video games, spicy fast food, computer, internet, and so on. They can see nature only on television or screen of the computers. More over some people living in the cities do not have relatives in villages and they never visited or stayed in village. These peoples want enjoy rural life but there is problem of such type of facilities. Hence, it is opportunity to the farmers for development of the agro-tourism centres and serves him and create additional income source.

### Scope And Methodology Of The Study :

The scope of the study is limited to examine the benefits and applicability of agro-tourism business in Maharashtra. The study includes their benefits and problems. As well as it includes appropriate framework regarding to establish the agro-tourism centres in the Maharashtra.

The present study was conducted on the agro-tourism is based on secondary data. The data has been furnished from the related articles, research papers, reports and 11th plan document of the government of India. Some data has furnished from the websites of the government of India and Maharashtra, as well as ministry of agriculture. Some ideas have been taken from the Tourism Development Corporation of Maharashtra.

### What is Agro-Tourism?

Farm recreation refers to activities conducted on private agricultural lands, which might include overnight stays, educational activities, etc. This category of tourism is a subset of a larger industry known as agro-tourism. Agro-tourism is "a commercial enterprise at a working farm, or agricultural plant conducted for the enjoyment of visitors that generates supplemental income for the owner."

### Who Can Start Agrio-Tourism Centres :

The individual farmer can start agro-tourism who have minimum two hector land, farm house, water resource and is interested to entertain the tourists. Apart from the individual farmer, agricultural co-operatives institute, Non-Government organizations, Agricultural Universities, and agricultural colleges may start their centre's. Even Grampanchayats can start such centers in their operational areas with the help of villagers and farmers.

### A : Infrastructure:-

- Accommodation facilities at same place or alliance with nearest hotels.
- Farmhouse, which has the rural look and feel comfortable along with all minimum required facilities.
- Rich resources in agriculture namely water and plants at the place.



- Cooking equipments for cooking food, if tourist have interested.
- Emergency medical cares with first aid box.
- The well or lake or swimming tank for fishing, swimming

• Bullock cart, cattle shade, telephone facilities etc.

### B : Facilities Should Provide :-

- Offer authentic rural Indian / Maharashtra food for breakfast, lunch and dinner.
- Farmers should offer to see and participate in the agricultural activities.
- Offer an opportunity to participate in the rural games to the tourist

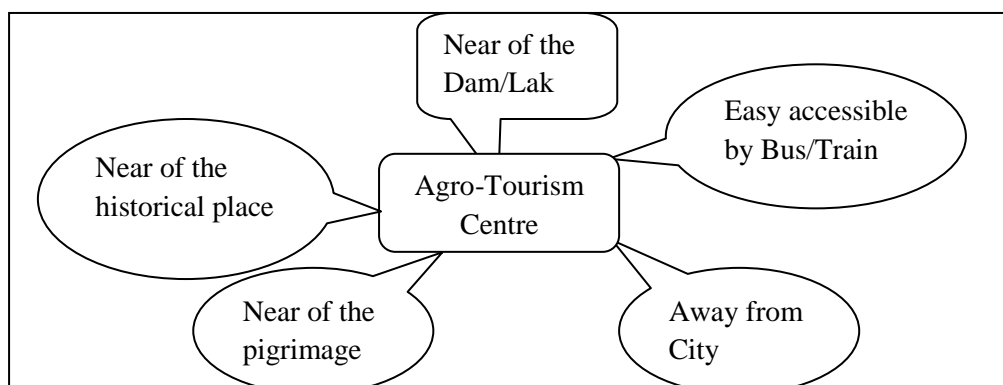


- Provide information them about the culture, dress, arts, crafts, festivals, rural traditions and also give possible demonstration of some arts.
- Offer bullock car for riding and horse riding, buffalo ride in the water, fishing facility in your pounds or nearest lake.
- Offer fruits, corns, groundnuts, sugarcane and other agro-products as per availability.
- Show local birds, animals and waterfalls etc and give authentic information about them.
- Must provide safety to tourists' with the support of alliance hospitals.
- Arrange folk dance programme, Shekoti folk songs bhajan, kirtana, lezim dance, dhangari gaja, etc.
- Available some agro-product to purchase to the tourist

**C : Other Miscellaneous:-**

- Offer pollution free environment to the tourists
- Try to create interest about the village culture for the future tourism business.
- Introduce the tourists with imminent persons of your village.
- Employ well-trained staff or funny (comedy) persons with good communication skill to entertain the tourist.
- To have authentic information regarding to the railway and bus time table for the help of tourists. Farmer can also provide other additional facilities to their requirements for the better satisfaction of tourists.

**Location For The Agro-Tourism Centre :** Location is most important factor for success in the agro-tourism. The location of the centre must easy to arrive and have a good natural background. Urban tourists are interested into enjoying the nature and rural life. So, farmers should develop their centre in the rural areas only which have a beautiful natural background to attract urban tourist in your farm.



The place of agro-tourism centre must need easy accessible by roads and railways. Tourists want to enjoy some historical and natural tourist places along with the agro-tourism. Hence, the centre should be developed near of these tourist places. It is more beneficial to both tourist and farmers. The places which are already tourist centres like Mahabaleswara, Panchgani ,Nashik, Jotiba, Narshinghvadi, Pandharpur, Akkalkot, Konkan etc. These are the better places for the development of agro-tourism. Other than these places farmer can develop their centres in any affordable places.

**Benefits Of Agro-Tourism Centres :**

Agro-Tourism has the potential to change the economic face of traditional agriculture. The benefits of agro-tourism development are manifold. It would bring many direct and indirect benefits to the farmers and rural people. Some of the benefits are following:-

1. Employment opportunities to the farmers including farm family members and youth
2. Additional income source for the farmers to protest against income fluctuation.
3. Cultural transformation between urban and rural peoples including social moral values
4. Farmers can improve their standard of living due to the contacts with urban peoples.



5. Benefits to the urban peoples, they can understand about the rural life and know about the agricultural activities.
6. It support for rural and agricultural development process.
7. Help to the reduce burden on the other traditional tourist centers.

### **Suggestion:**

1. A complete tourism package can be provided through initiation by the local government bodies of activities such as beautification campaigns, sponsorship of special events that tie in with local tourist attractions and participation of all businesses in the area.
2. Good community leadership: Successful tourism promotion and development requires good leadership by open minded and enthusiastic persons from local government, community groups, the business community and non-profit organizations such as chamber of commerce and convention and visitor bureaus.
3. Support and participation of local government: The role of local government is especially important in the following areas; funding for tourism development and promotion, creating and maintenance of infrastructure necessary for tourism, zoning and maintenance of the community so that it looks clean and appealing to tourists and educational support for farmers.

### **Conclusion:**

1. Maharashtra has a great potential to the development of Agro-tourism, because of natural conditions and different types of Agro products as well as variety of rural traditions, festivals.
2. Maharashtra tourism industry is growing rapidly. By introducing Agro tourism concept the value addition contributes to future growers.
3. Through Agro- tourism development farmer can develop themselves into entrepreneur.
4. Agro- tourism contributes to rural development by creating employment opportunity and empowerment of rural people.

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## Co-Operative Water Management: Social-Economic And Ecological Dimensions

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### Introduction:

Irrigation is the artificial application of water usually for assisting in growing crops. In crop irrigated agricultural is up against an enormous challenge. India's population continues to grow at a tremendous rate. Over the next 10 years, there will be more extra mouths to feed. Water is becoming increasingly scarce for agriculture, with conflicting demands being made on limited supplies by the domestic and industrial sectors. The most attractive irrigation sites have already been exploited. Yet, irrigated agriculture will have to deliver average output increase of at least 3.5 per cent per year if future food demands are to be met in India. Forty years ago in the 1960 and 1970, India was worried about its capacity to produce sufficient food to feed its growing population. Episodes of food scarcity were not uncommon. It was dreaded that millions would die of hunger. Then dawned the miracle of the 'green revolution' Cereal production increased by leaps and bounds, boosted by expanded irrigation, increased fertilizer application and modern crop varieties. The vigorous response in mobilizing financing towards boosting agricultural production paid off.

The lift irrigation co-operatives development infrastructure and intuitional arrangements in the some changes affecting the impact of development which has social, economic and ecological dimension, in the context of issue relating to sustainable rural development. The researcher has analysis of the lift irrigation co-operatives and sustainable development on the main issues such as social, economic and ecological dimensions of Kolhapur district.

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In the coming years the irrigation sector will be in ferment, with decision makers, agency managers and farmers needing better information and strategic processes to make intelligent choice in the management of irrigated agriculture.

### Survey of Related Literature:

The purpose of a review is to analyze critically a segment of published body of knowledge through summary, classification and comparison of prior research studies, reviews of literature and theoretical articles. The review of literature is helpful to the researcher to critically analyze the issues pertaining to research paper.

Some scholars have shown that, there are some successful experiments of co-operative water users' societies utilising canal irrigation water in Maharashtra Upadhye, 1994); Deshpande(1994). In the absence of development of canal irrigation in some parts of Western Maharashtra, the co-operative efforts enabling an access to irrigation have been normally articulated through farmers' lift irrigation co-operatives.

Bokil's (1996:42-47) case study of a "Vishwambhar" lift irrigation co-operative located in Western Maharashtra has demonstrated the success of collective management of water resources.

Sarjerao A. Salukhe's case study of "Dhantek" lift irrigation co-operative located in Shirala taluka of Sangli district in Maharashtra has brought out that, the water resources made available by this co-operative were being fairly distributed among the poor and well-to-do sections of the peasant community, according to their needs, based on their rights in land. (Sarjerao Salukhe, 1998: 253)

**The Theoretical Perspective:** Social- ecological perspective is adopted for the present study, social ecology rests on the awareness of the interdependence of the ecological infrastructure and social, economic, political and cultural domains created by human beings.

**Aims of Research:** The present research paper aims is to understand and critically examine the existing water management practices in the context of rural development of social, economical and ecological in the Kolhapur district.

**Objectives of Research:**

- 1] To examine the existing water management practices.
- 2] To find out social, economic and ecological dimensions.

**Hypotheses of Research:**

1. The existing water management practices adopted by lift irrigation co-operatives are not ecologically conducive for sustainable agriculture.

**The Conceptual Framework:** The conceptual framework for the present study is as per the following are lift irrigation co-operatives contributing to the sustainable development? In order to answer this question, the concept of sustainable development is conceived, understood and examined in terms of three major dimensions and relevant questions.

**1. Social Dimension of Sustainability:** Do lift irrigation co-operatives benefit the lower strata of the village peasantry and elicit participation of socially underprivileged section of the village community in the process of rural development?

**2. Economic Dimension of Sustainability:** Do lift irrigation co-operatives contribute to the improvement in the level of income and material living conditions of beneficiary farmers? Do they also benefit non-members, particularly persons from lower strata of village community such as landless labourers?

**3. Ecological Dimension of Sustainability:** Whether the change in cropping pattern is facilitated by the lift irrigation co-operatives and the pattern of ecological resource base? An attempt had made in present study to provide answers to the above questions. In other words, the impact of lift irrigation co-operatives in Kolhapur district had examined in the conceptual framework of sustainable development; to be specific, in the context of social, economic and ecological dimensions of sustainable development. Keeping in view the above central research questions pertaining to the three dimensions of sustainable development data on relevant variables was collected.

**Research Design:** The present study is based on descriptive research design. The research was carried out among beneficiary farmers; it has attempted to describe the co-operative water management and social, economic and ecological dimensions of lift irrigation co-operatives in Kolhapur district.

**Research Methodology:** The present study made an attempt to identify with the opinion of the beneficiary farmers of lift irrigation co-operatives in Kolhapur district for any research venture, it is essential to have a sound methodology. This gives an accurate framework to carry out research systematically. The research strangely focused on Kolhapur district of Maharashtra in India.

**Scope of the Study:** The scope of study is only limited to understand the co-operative water management and social, economical and ecological dimensions in lift irrigation co-operatives in Kolhapur district.

**Universe of the study:** The geographical universe of the study comprises of beneficiary farmers of lift irrigation co-operatives in Kolhapur district. The universe of the study is 60 beneficiary farmers in six talukas.

**Sampling of the study:** There are 12 talukas in Kolhapur districts, initially by resorting to systematic sampling six talukas were selected, then taluka -wise list of lift irrigation co-operatives were prepared.

By using taluka-wise list of sampling, from each six talukas, two lift irrigation co-operatives were selected by resorting to random sampling [lottery method] techniques. The total samples thus constitute 12 lift irrigation co-operatives, each lift irrigation co-operative 5 beneficiaries farmer were selected for the present research work. Total respondents are 60 from selected lift irrigation co-operatives in Kolhapur district.

**Tools of Data Collection:**In order to fulfil the objective of study, the tools were developed to gather primary data from various respondents with regard to beneficiary farmers. Questionnaire covered background of the beneficiary farmers of lift irrigation co-operatives in Kolhapur district.

**Methods of data collection:** The researcher has used two types of data collection such as following.

**I] Primary data:** The researcher has collected primary data through questionnaire.

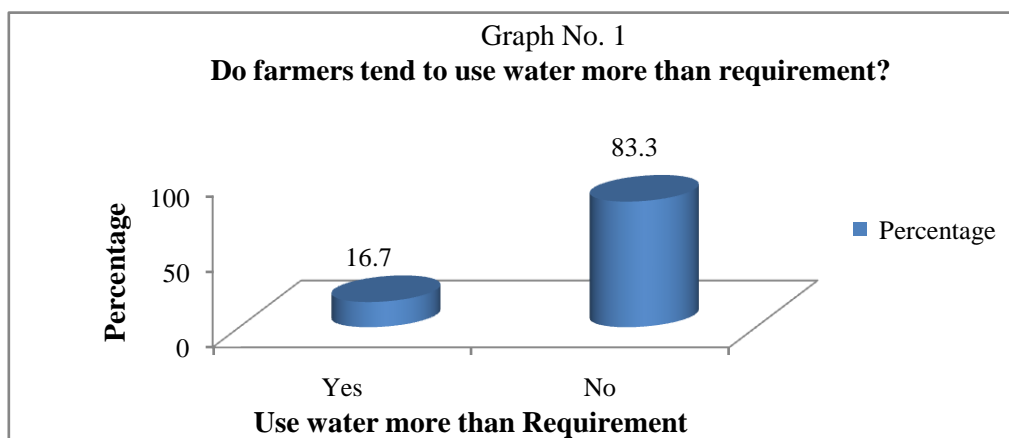
**II] Secondary data:** The researcher also gathered data from secondary sources with regard to co-operative water management and social, economical and ecological dimensions of beneficiary farmers in lift irrigation co-operatives. The secondary data collected from reports national, international journals, books, newspapers, articles and from the internet web pages.

**Aspects of Co-operative Water Management:**In this research paper, the researcher has discussed on various aspects of co-operative water management. The data collected on the various aspects such as who decides water distribution among members of water co-operatives? Who supervisors water distribution? Who attends water distribution complaints? Whether disputes emerge among the farmer members? How these disputes are resolved? Which methods adopted for giving water to the crops? Whether the farmers have adopted modern methods of irrigation? Which reasons for non-adoption of modern techniques of irrigation? Do farmers tend to use more water than the requirement? Do they give proper attention towards rational and judicious use of water resources? What are the water charges for members and non-members? The researcher has analyzed these questions.

**Methods being used for giving water to the Crops:** An enquiry was made regarding the methods used by farmers of the lift irrigation co-operatives for giving water to the crops. The information revealed that, the farmers were using four such methods Wakhura, Labsari, Sakhali and Patta. As the frequency of the responses revealed Wakhura method was the most prominent among all. The Patta method, however, was used only by some farmers, more progressive on thus, the farmers were mainly adopting traditional methods of giving water to the crops. It is important to note that, none of the secretaries repaired that, farmers use modern methods of giving water to the crops such the drip or sprinkler method.

The reasons for non-adoption of modern techniques of irrigation were also sought from the respondents. The analysis of the data in this regard has revealed certain reasons for non -adoption of modern techniques of irrigation. The abundant availability of water, such techniques being more costly, supervision and maintenance being difficult and expressive, small size of pieces of land owned by the farmers possibility of non-availability of water on the time were some of the prominent reasons for non- adoption of modern water saving techniques of irrigation such as drip irrigation and sprinkler irrigation.

**Tendency to use Water more than the Requirement to the Crops:**A question was asked 'according to the observation of patkaries, do farmers use water than the requirement? The responses given to this question by the secretaries of lift irrigation co-operatives are classified in the graph No.1



As the data presented in the graph No. 1 reveal, [2 or 16.7%] of the secretaries have said 'Yes' indicating that farmers use more water than the requirement to the crops ,whereas [10 or 83.3%]

secretaries have said 'No' farmers use more water than the requirement. The responses, thus, clearly reveal that farmers tendency to no use more water than the requirement of the crops.

**Farmers Role in Water Management:** The acceptance and official recognition to the idea of farmers participation in water management was reflected in the National Water Policy 1987, farmer should be involved progressively in various aspects of management of lift irrigation systems particularly in water distribution and collecting of water rates. Eventually, the important of farmers' participation in water management was increasingly being propagated. The express in the field have had emphasized the opinion that, electing farmers participation in irrigation management could be the only way for prosperity in agriculture. In the present position in Maharashtra, the movement of establishing water co-operatives took momentum. There are some successful experiments of co-operative water uses societies utilising canal irrigation water in Maharashtra.

Thus, farmers will be plays an important role in the development of rural agricultural development by irrigation management systems. It is in this context that the sustainable on farmers agricultural in the field of irrigation management deserve special sustainability.

**Major Findings:** The researcher has find out the five major findings in the present research work which are given as below.

1. Changing attitude of peoples about the cropping pattern
2. Use of water is more than requirement
3. Farmers absence on farm while water is giving to the crops
4. Use of fertilizers is more than requirement
5. Land degradation

**Suggestions:** The researcher has suggested for farmer beneficiaries of lift irrigation co-operatives. The suggestion has given for the beneficiaries as per the following.

1. Avoid over-use of water
2. Avoid over use of Chemical Fertilizers
3. Effectively Manage the Water Resources
4. Distribution of water should be based on clock hour basis.
5. Ensuring attendance of the farmer member on the farm when water released to crop.
6. Use of water saving methods of irrigation.

#### **Conclusion:**

Lift Irrigation co-operatives are play a vital role to the well being of the people in this world and play an important role in local, national and international growth and development. However, irrigation also has created problems, such as degradation of land and water management, socio-economic and cultural effects on society, and environmental damage.

To conclude, the present study revealed that, the lift irrigation co-operative in the Kolhapur district.

1. Enabled lower strata of peasantry to have an access to irrigation which was otherwise impossible due to lack of individual property.
2. Resulted in strong change in the pattern of cropping leading to rare increase in land under sugarcane cultivation.
3. Facilitated the development of modern agricultural practices.

The lift irrigation co-operatives have benefited the underprivileged section of the rural community; it is agencies for economic and social development. Sugarcane mono cropping facilitated by lift irrigation co-operatives and neglect the water management by the farmers indicate signs of ecological development. The lift irrigation co-operatives play vital role in rural development.

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## Agriculture and Rural Development Scenario

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### Introduction:

India is fundamentally an agricultural country. Indian society is predominantly an agrarian society wherein two-thirds of the country's population is still dependent on agriculture for its nourishment. Although the share of agriculture in the gross national product has declined from 2011, it still forms the core of India's economy. So much so that even the progress and performance of the industrial sector is heavily dependent on the supply of agriculture raw material. Besides meeting food necessities of India's huge population agriculture provides the raw material to agro-based industries, account for the largest chunk of employment to the labour force and earns considerable amount of valuable foreign exchange.

Agriculture not only includes crop growing but all other allied activities like animal rearing, horticulture closed to land. Any economic endeavor that utilizes directly the natural resources of soil and water for production is included in farming. The topographical and climatic conditions have favored India to utilize more than 55 per cent of its area for agricultural objectives against the world average of only 11 per cent. While most of the world's countries raise only one crop, India has the potential to raise two. The area that can be brought under irrigation is approximately equal to the total net cultivated of China.

The term rural development is a subset of the broader term development. Development is a universally cherished goal of individuals, families, communities and nations all over the world. It is also natural in the sense that all forms of life on planet Earth have an inherent urge to survive and develop.

Development is a subjective and value added concept, and hence there cannot be a consensus as to its meaning. The term is used differently in diverse contexts. It basically means unfolding, revealing or opening up something which is latent. When applied to human beings, it therefore means unfolding or opening their potential powers. Generally speaking, the term development implies a change that is desirable. Since what is desirable at a particular time, place and in particular culture may not be desirable at other places, or at other times at desirable at a particular time, place and in particular culture may not be desirable at other places, or at other times at the same place and in the same cultural milieu. It is impossible to think of a universally acceptable definition of development. At best, development in the context of rural society could be conceptualized as a set of desirable societal objectives which society seeks to achieve. Thus development means it is cherished by all individuals, communities and nations, irrespective of their culture, religion and spatial location.

The term rural development connotes overall development of rural areas with a view to improve the quality of life of rural people. In this sense, it is a comprehensive and multi-dimensional concept and encompasses the development of agriculture and allied activities, village and cottage industries and crafts, socio-economic infrastructure, community services and facilities and above all the human resources in rural areas. As a phenomenon rural development is the end-result of interactions between various physical, technological, economic socio-cultural and institutional factors. It is designed to improve the economic and social well-being of a specific group of people, it is multi-disciplinary in nature, representing intersection of agricultural, social, behavioral, engineering and management science.

Rural development is a strategy to enable a specific group of people, poor rural women and men, to gain for themselves and their children more of what they want and need. It involves helping

the poorest among those who seek a livelihood in the rural areas to demand and control more of the benefits rural development. The group includes small scale farmers, tenants, and the landless. Thus the term rural development may be used to imply anyone of the above mentioned connotations. That is rural development is defined as a process leading to sustainable improvement in the quality of life of rural people, especially the poor.

### **Agriculture Development**

Agriculture development has three distinct but related dimensions the physical-technical, the economic- financial and the dimension the institution-human. The physical-technical dimension addresses land utilization, agricultural technologies, research and extension, agriculture inputs, farm to market access, productivity and production maximization, and so on. Agriculture development from the economic-financial perspective is concerned with costs, factors of production, terms if trade, pricing policies, subsidies, the like.

The institutional-human dimension looks at knowledge and skills, organization and management, training, implementation capacity, social relations, politics, communication, motivation, participation, local government, public private sector linkages, culture and values, historical experience and agriculture development, as with much of the development field, has tended to be the province of the technical and economic specialists. Their language and concerns have dominated the analysis of rural and agricultural sector issues, the specification of agricultural development objectives, and the design of programmers and project to achieve those objectives. The institutional-human dimension has frequently been either completely ignored or treated as a source of problems or constraints to achieving technical and economic targets, a residual category for anything not defined as technical or economic.

Recognition of the importance of institutional and human factors in socio-economic development in general has increased substantially over the past 15 years and is now high priority area of attention by donor agencies and developing country government alike. Being a social technology, institutional development does suffer in the eyes of crop scientists, agricultural economists and microeconomic analysts from a lack of specificity, predictability and hard and fast rules. Despite its softness institutional development is a frequently espoused need of developing country officials and an aim often expressed by donor agencies.

This goal institutional development is nowhere more important than in the rural and agriculture sectors, which continue to be the source of most employment in developing countries. Except for emergency relief, where the delivery of food for consumption is unavoidable donor policies stress that assistance for the countryside should be an investment that it generate a flow of benefits that endures after the external funds run out. The cumulative lessons of experience show that to have lasting impact donor efforts to improve rural areas in the developing countries, and agriculture in particular, need to work with durable indigenous institutions both at the central and local levels. It is not surprising that, in the 1990s, institutional sustainability is emerging as one of the major problem areas for sectoral management as well as for public administration of core government functions in developing nations.

The early rural sociologists primarily conceived of agriculture as one of the major institutional ensembles affecting rural community life and especially during the 1930s, devoted much of their research effort relating to agriculture to understanding the implications of agriculture structural changes for rural community life and viability.

The conceptualization of agriculture and rural community interactions and the methodologies for exploring these interactions in pre-Korean War and post 1970 rural sociological research however, exhibit dramatic differences. Whereas most of the early rural sociologists tended to be less interested in agriculture per se and were principally concerned with understanding rural community institutions, contemporary researchers have tended to be more interested in structural change in agriculture and have deemphasized understanding totality of the fabric of rural social life.

Few rural development endeavors confront the issues and challenges of sustainability more directly than the provision of credit to agricultural and rural producers. Agriculture lending, particularly to small farmers, has a nearly three-decade history of paring donor agencies with developing country governments to promote economic development by alleviating credit constraints. Despite the relatively large amounts of credit directed towards rural producers, results have often been disappointing.

Provision of agricultural credit has been pursued in the context of both production and equity objectives. The strategy generally employed is to increase the total supply and reduce the cost. By making cheap credit widely available to the rural poor it was thought that production would be increased, with the added benefit of improving the income distribution of the rural poor. Credit policies and programmes have been based on a set of heroic assumptions about small rural production and their access to financial services. These include for example that small producers must be induced to adopt agricultural innovations by offers of cheap credit that they have no savings capacity and that with limited access to commercial credit they must rely on usurious informal sources, such as money lenders or pawnbrokers.

The lending landscape created by acting on these assumptions features convoluted regulations, special funds, complex rediscounting and reserve arrangement, loan guarantees and other incentives to encourage lenders to increase credit flows to the rural poor. Special programmes and institutions, each with their own objectives, targeted particular groups to get credit, in what amount, and for which. Financial markets have become fragmented, rather than integrated, as new entities, such as agricultural credit agencies, development banks, and cooperatives were created to disburse and monitor these supervised credit programmes. With such a narrow focus on credit disbursement, many lenders either failed to, or were even prevented from providing deposit and savings services rural producers. Besides dysfunctional fragmentation, rural financial markets exhibit high degrees of inefficiency, ineffectiveness, and distortion. Populating the credit landscape are institutions with programmes plagued by loan recovery problems, outright failure to repay, chronic dependency on subsidies and external support, and excessive transactions costs for both the institution and clients.

From a nation dependent on food imports to feed its population, India today is not only self-sufficient in grain production but also has a substantial reserve. The progress made by agriculture in the last four decades has been one of the biggest success stories of free India. Agriculture and allied activities constitute the single largest contributor to the gross domestic product, almost 33 per cent of it. Agriculture is the means of livelihood of about two-thirds of the workforce in the country.

This increase in agricultural production has been brought about by bringing additional area under cultivation, extension of irrigation facilities, the use of improved high-yielding variety of seeds, better techniques evolved through agricultural research, water management, and plant protection through judicious use fertilizers, pesticides and cropping practices.

### **Crops**

The 1970s saw a multi-fold increase in wheat production that heralded the green revolution. In the next decade rice production rose significantly; in 1995-96, rice production crossed 211 million tonnes in 2001-02, a big leap from 51 million tonnes in 1950-51.

To carry improved technologies to farmers, a national pulse development programme, covering 13 states, was launched in 1986. Efforts to boost pulse production were augmented further by the special food production programme. In 2001-02, pulse more than the statutory minimum price, sugar cane production also received a boost, and in 2001-02 a record 292.2 million tonnes was registered.

### **Fertilizers**

The fertilizer industry in India has grown tremendously in the last 30 years. The government is keen to see that fertilizer reaches the farmers in the remote and hilly areas. It has been decided to decontrol the prices, distribution and movement of phosphatic and potassic fertilizers. Steps have been

taken to ensure an increase in the supply of non-chemical fertilizers at reasonable prices. There bio-fertilizers are regarded as an effective, cheap and renewable supplement to chemical fertilizers, the Government is implementing a National Project on Development and Use of Bio-fertilizer. Under this scheme, one national and six regional centers for organizing training, demonstrating programmes and quality testing of bio-fertilizers has been taken up.

### **Fisheries**

Fish production achieved an all time high of 6.7 million tones at the end of 2011-12. Programmes that have helped boost production include the National Programme of Developing Fish Seed, Fish Farmers Development Agencies. The Central Institute of Fisheries Nautical and Engineering Training trains the necessary manpower. To diversify fishing methods and introduce processed fish products on a semi-commercial scale, an Integrated Fisheries project has been launched. A National Fisheries Advisory board has also been established.

The apex body for education, research, training and transfer of technology in the field of agriculture is the Indian Council of Agriculture Research (ICAR) established 1929. India's transformation from a food deficit to a food surplus country is largely due to ICAR's smooth and rapid transfer of farm technology from the laboratory to the land. ICAR discharges its responsibilities through 43 research institutes.

The increase in production was largely contributed by soyabean, rapeseed and mustard. Production of pulse has seen many ups and downs, which is expected to be checked under the mission. The country grows mainly nine oilseeds with groundnut, rapeseed and mustard accounting for 62 per cent of total production. Lately, soyabean and sunflower have shown major growth potential.

### **Green Revolution**

After independence, considering India's growing population, the government took steps to increase the food production. Yields per unit area of all crops have grown since 1950. The 1970s saw a huge increase in India's wheat production. This is known as green Revolution. Reasons for the growth are the special emphasis placed on agriculture and steady improvements in irrigation, technology, application of modern agricultural practices and provision of agricultural credit and subsidies.

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**Technological Development In Agriculture: A Case Study Of Mahabaleshwar Taluka****Dr. Shrikant Tukaram Ghadge** Asst.Professor,

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**Abstract**

*Agricultural development is a strategic element in the process of economic development of a country. It has already made a significant contribution to the economic prosperity of the advanced countries. India being predominantly an agricultural and overpopulated country, the development of agriculture with increased output and productivity would contribute substantially to overall economic growth of a country. The development of agriculture is a process through which the shift takes place from the stage of traditional agriculture to the stage of modernized agriculture resulting in increased productivity and production per unit of resource due to use of modern technology. The development in agriculture sector is observed in Mahabaleshwar Taluka. Transformation of agriculture from subsistence to commercial purpose is experienced in this Taluka because of tourism development. The main agriculture products are grown in this Taluka is strawberry, potatoes, carrots, maize, rice and wheat etc. In some agriculture fields there are nurseries of ornamental and flower plants are observed. Mahabaleshwar Taluka is having very distinct physical character. It is located between 17<sup>o</sup> 42' North to 18<sup>o</sup> 60' North latitude and 73<sup>o</sup> 21' East to 73<sup>o</sup> 51' East longitude in Satara district of West Maharashtra. The main objective of present research paper is to analyse technological development in agriculture in study area and suggest some remedial measures for overall development of agriculture in study area.*

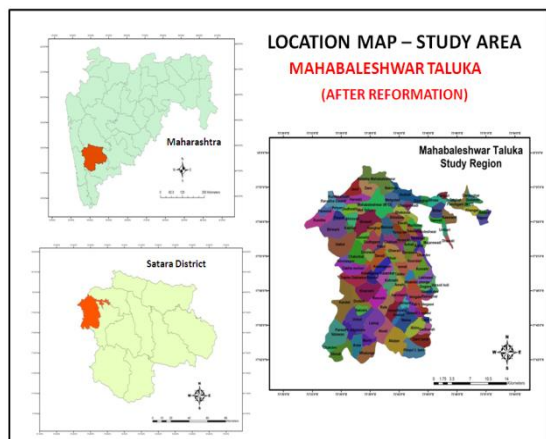
**Keywords:** - Technological, Development, Agriculture, Transformation, Irrigation, Aspects, Measures etc

**1. Introduction**

Agriculture plays an essential role in the process of economic development of less developed countries like India. Besides providing food to nation, agriculture is labor intensive, provides saving, contributes to market of industrial goods and earns foreign exchange. Around 82 percent of total working population was engaged in agriculture. This confirms that Indian economy was a backward and agricultural based economy at the time of Independence. After 66 year of Independence, the share of agriculture in total national income declined from 50 percent in 1950 to 13.7 percent in 2012-13. But even today more than 54 percent of workforce is engaged in agriculture (Census, 2011). In spite of this, important feature that is to be noted that growth of other sectors and overall economy depends on the performance of agriculture to a considerable extent. Because of these reasons agriculture continues to be the dominant sector in Indian economy. The development of agriculture has significant effects on the growth of other sectors of the economy. It helps the process of industrialization by providing raw material to the leading agro-based industries as well as small scale and cottage industries. The technological development in agriculture means the application of modern techniques in agriculture such as new varieties of seeds, chemical fertilizers and pesticides, irrigation, soil conservation techniques and other several methods of raising yield and net returns per hectore. (R. K. Lekhi, 1984). In the present study attempt has been made to study the technological development in agriculture in Mahabaleshwar Taluka. These technological development in agriculture is includes different aspects such as irrigation, agricultural machinery, adoption of improved seeds, use of chemical fertilizer, pesticides, agricultural loans, implementation of soil conservation techniques, improvement in means of transport and agricultural marketing etc. All these aspects have given rise to many agricultural charges in Mahabaleshwar Taluka.



## 2. Study Area:-



Mahabaleshwar taluka is having very distinct physical character. It is located between 17<sup>0</sup> 42' North to 18<sup>0</sup> 60' North latitude and 73<sup>0</sup> 21' East to 73<sup>0</sup> 51' East longitude in Satara district of West Maharashtra. The taluka is bounded in North West by Raigad district, in West by Ratnagiri district, in South by Patan taluka and in East by Satara and in North East by Wai taluka. The total geographical area of Mahabaleshwar taluka is 495.50 Sq km. The total taluka is surrounded by Sahyadri Mountains, and having a famous hill station Mahabaleshwar located at 1436 m above msl.

## 3. Objective: -

The main objectives of present research paper are as follows:-

1. To analyse technological development in agriculture in study area.
2. To suggest some remedial measures for overall agriculture development in study area.

## 4. Data Collection And Methodology

Geography is a science, based on empirical studies, which requires data collection from various sources. This present study is based on the reliable and accurate primary and secondary data. This study is carried out at village level.

### A. Primary Data sources:

The required primary data has been collected by personal discussion, survey and field observation methods etc.

### B. Secondary Data Sources:

The required secondary data has been collected from the following sources.

- 1) District census handbook of Satara District.
- 2) Socio- Economic Abstracts of Satara District.
- 3) Records of Zilla Parishad Panchayat Samiti, Talathi offices.
- 4) District Gazetteer of Satara.
- 5) News paper cuttings and articles.
- 6) World Wide Websites (Internet).

The success of research work is depends upon the methodology adopted for the study. In this proposed study tahsil has been considered as a unit for analysis. For the analyzing the collected data various appropriate statistical techniques like percentage, average have been employed. The map and diagrams are prepared by employing various cartographic techniques such as bar and line graph, pie diagram for better comprehension.

## 6. Discussion:-

### Technological Developments In Agriculture

These technological development in agriculture is includes different aspects such as irrigation, agricultural machinery, adoption of improved seeds, use of chemical fertilizer, pesticides, agricultural loans, implementation of soil conservation techniques, improvement in means of transport and agricultural marketing etc. All these aspects have given rise to many agricultural charges in Mahabaleshwar Taluka. These technological developments in agriculture are analyzed as follows.

### I. Irrigation

The proportion of irrigated area to gross cultivated area plays a crucial role in determining the productivity of land, level of income, employment opportunities in agriculture and development of a region. The table No.1 shows the change in irrigation facilities, during the years 1970 – 71 to 2004 – 05 in Mahabaleshwar Taluka.

**Table No.1: Change in irrigated area by different sources in Mahabaleshwar Taluka.  
 (1970-71 to 2004-05) (Area in hectares)**

Sr. No.	Classification	Years		Volume of change
		1970-71	2004-05	
1	Surface irrigation	335	931	+ 596
2	Well irrigation	121	3325	+ 3204
3	Total Net area irrigated	456	4256	+ 3800
4	Total Gross area irrigated	548	3159	+ 2611

**Source: – Based on Socio- Economic Abstract of Satara, (1970-71 and 2004-05)**

On the basis of above statistics it is clear that during 1970-71 to 2004-05; the intensity of irrigation is increased significantly in this taluka which can bring out a big transformation in economy of rural sector. It happens because of the development in different irrigation sources in this taluka with changing agricultural practices.

### II. Agricultural Implements

Agricultural Implements play important role for the development of agriculture sector. Thirty five years before the indigenous agriculture implements like wooden ploughs, iron ploughs are operated through bullocks, but now the situation is quite change. The farmers started to use modern implements in agriculture for increasing production. The use of modern agricultural implements is more significant in the area of commercial farming in this taluka. The modern agricultural implements used in this taluka are mainly oil engine, electric pumps, tractors etc. Table No.2 show change in used of agricultural machinery in Mahabaleshwar taluka.

**Table No 2: Agricultural Implements used in Mahabaleshwar taluka  
 (1971-2005)**

Sr. No.	Name of Agriculture Machinery	Year		Volume of change
		1970-71	2004-05	
1	Wooden ploughs	1,011	610	- 401
2	Iron ploughs	170	48	- 122
3	Carts	81	53	- 28
4	Oil engine used for irrigation	31	198	+ 167
5	Electric pumps used in irrigation	35	143	+ 108
6	Tractors	00	28	+ 28

**Source:–Based on Socio-Economic Abstract of Satara (1970-71 and 2004-05).**

The table above table No.2 reveals the use of agricultural implements in Mahabaleshwar taluka from 1970-71 to 2004-05. On the basis of above statistics it is clear that the use of traditional agricultural equipment in the agricultural farm is decreased but the use of modern agriculture equipment in the agricultural farm is increased because of modernization and commercialization in agriculture.

### III. Improved Seeds

The domestic varieties of seeds are unsuitable for the new production techniques. So, high yielding varieties of seeds are used which added new scene in cropping pattern. The rapid adoption of high yielding varieties was starting after improvement in the supply of irrigation sources and successful research related to agriculture in this taluka. The following table No.3 shows the improved seeds used in agricultural field in study region are as follows.

**Table No.3: Use of Improved Seeds in Mahabaleshwar Taluka (2004-05)**

Sr. No.	Name of Crops	Name of Improved Seeds
1	Rice	Indrayani, Basmati, R-24,Ratnagiri
2	Wheat	HD 2189, Trimbak, Lok-1
3	Nachani	Dapoli – 1
4	Strawberry	Winter down, Sweet charley, Kama-Roja, Nabiya, Raniya
5	French bean	Selection -9
6	Green Pease	Arka –Komal, Arkel, Golden

**Source:-** Agriculture Office, Mahabaleshwar. (2004-05).

The above table No.3 reveals that the use of improved seeds in agriculture in Mahabaleshwar taluka. The use of improved seeds in agriculture is increased in crops like rice, wheat, nachani, strawberry, frenchbean and green peace etc due to the modernization and commercialization in agriculture because of development in tourism industry.

#### IV. Chemical Fertilizers

Because of the extension of area under fruits and vegetables the use of chemical fertilizers has been increased rapidly. Ammonium sulphat, super phosphate and urea are the main fertilizers used in this region. In 1970 – 71, 440 MT chemical fertilizers used in agriculture which is increased 1174 MT in 2004 – 2005. The use of these fertilizers is not the same thought the taluka. Being generally higher in the irrigated area. The obstacles in the lesser use of fertilizers are lower intensity of irrigation, lack of finance and high prices, non-availability at the required time and small farm holding size which discourages farmers to the use of fertilizers in some rural area of this taluka.

#### V. Chemical Pesticides

With the introduction of new varieties of crops which are highly susceptible to pests and diseases e.g. strawberry. Much of the crop losses (10 to 30 %) due to the pests and weeds could be reduced by timely and adequate plant protection measures (Singh 1997). Pests and diseases can seriously damage the crop, if adequate measures are not taken in time. In 1970 -71, 5 to 10 liters chemical pesticides used in farm which is increased 800 to 900 liters in 2004 – 2005. The pattern of distribution of chemical pesticides is depending on the intensity of irrigation and type of crop raised in region. Their use is significantly high in eastern part of this taluka. Elsewhere, the use of plant protection material is small and even negligible due to limited economic means of farmers in this taluka.

#### VI. Agriculture Marketing

The type of agriculture was changed according to the development of tourism in Mahabaleshwar taluka. In earlier days, traditional or subsistence type of agriculture was done in this taluka but now a day this agriculture is done in commercial ways.

The goods which are produced from agriculture have great demand in local market in this taluka. Tourist basic demands related to agro-products are fulfilled because of availability of these agricultural goods. Prominently, vegetables, fruits, rice and wheat are produced from agriculture in this taluka. Vegetables consist of frenchbean, green peace, potato and fruits consist of strawberry, radish, carrot, jackfruit, and mango. Out of these vegetables and fruits strawberries, French beam, green peace, mango and jackfruit are exported. Strawberry is main agricultural product exported in large scale and they got international market in world. The duration of exporting of these agriculture products is between Octobers to June. Through co-operative service societies in rural area, this agricultural product is directly purchased from farmers and that is sold to some local private companies also such as Mapro, Malas, Manama and Pure berry etc. Some agricultural good is exported to Vashi market, New Mumbai. From this market these agricultural goods is exported to big cities such as Goa, Hyderabad, Bangalore, Kolkata, Pune, and Mumbai. The following table No.4 shows the total no. of transport companies in Mahabaleshwar taluka.

**Table No.4: Transport Companies in Mahabaleshwar Taluka**

Sr.No	Name of transport company	Place
1	M.R.Bhilare transport company	Bhilar
2	Mahabaleshwar – Mumbai Daily transport Service	Mahabaleshwar
3	Balaji Transport company	Mahabaleshwar
4	Shetkari Transport company	Metgutad
5	Mahabaleshwar Fruit transport company	Bhilar

**Source:** Based on field work, 2012-13.

The above table No.4 shows the 05 main transport companies in Mahabaleshwar taluka. Among them 03 transport company is located in Bhilar and Metgutad villages and remaining two transport companies located in Mahabaleshwar.

### VII. Agricultural Loan

The Satara District co-operative bank provides finance to 14, Co-operative service societies in Mahabaleshwar taluka which can provide the loan to the farmers in low interest's rate. The loan in low interest's rate is made available to the farmers by IDBI Bank, State bank of India, Bank of Maharashtra. which are governments approved bank. These banks are provided loan to the farmers for the purchasing manure and seeds, agricultural equipments, milky cows and buffalos etc. Thus the main purpose of providing loans in low interest rate to the small farmers and agriculture labors is it may help to them to improve their overall socio-economical condition in this taluka.

### VIII. Soil Conservation

Mahabaleshwar taluka is located in Sahyadri hill ranges. The intensity of rainfall is high in this taluka due to these reasons the problem of soil erosion is strongly observed in this taluka. So, to decrease the intensity of soil erosion and to increase the production from agriculture contour bunding, contour ploughing and terracing of land, afforestation, checking overgrazing, crop rotation etc. soil conservation techniques are being implemented successfully in this taluka. Bunding is basically beneficial to hilly area because of prevention of sheet erosion of land. In the hill and heavy rainfall areas located in the western part of this taluka terracing and afforestation is helpful to prevent the soil erosion. Because of implementation of such soil conservation techniques the intensity of soil erosion has been decreased and the production from agriculture has been increased in this taluka.

### X. Roads Development

Roads are one of the most important linkages in the process of change in agriculture. They contribute significantly to mobilization of resources and bring the closer gaps between rural and urban communities. The roads is playing very important role in Mahabaleshwar taluka because this taluka is located in hilly area where railways transportation is absent. The overall progress of road system was slow in the region, but road network is developed in the villages which are located near to Mahabaleshwar and Panchagani hill stations. These roads are help to move agricultural goods towards Mahabaleshwar and Panchagani tourist centers and other domestic and international market.

### 7. Findings And Recommendations

The technological development in agriculture is experienced in this taluka. The study of technological development in agriculture is reveals that the intensity of irrigation is increased significantly in this taluka which can bring out a big transformation in rural sector of economy. The use of traditional agricultural equipment in the farm is decreased but the use of modern agriculture equipment is increased as well as the use of improved seeds is increased in crops like rice, wheat, nachani, strawberry, frenchbean and green peace because of modernization in agriculture due to tourism. The use of fertilizers and pesticides is also increased in this taluka. The development in agricultural marketing system, agricultural loan facility, development in road network and

implementation of soil conservation techniques is occurs in this taluka. The researcher suggested some remedial measures for overall agricultural development as follows:

1. For purchasing modern agricultural equipment subsidy should be given mainly to the farmers below poverty line.

2. Milk production is main subsidiary activity of the farmers in this taluka. Demand of milk is increased mainly in hotels industry because of development of tourism industry. In this situation there is good chance to development of such industries in rural area. Thus there is need to provide subsidy to purchase higher quality livestock to the landless and below poverty line rural people.

3. For improving the status of rural people with the help of tourism industry, it is necessary to increase not only agricultural production but also develop agro-processing and agro-supporting industry, for exam. Production of Jam from fruits such as strawberry, Mushroom agriculture, honey production, floriculture, horticulture, dairy and poultry industry etc. Such industrial units should be established in rural area. These industries would contribute development of rural population in this taluka.

4. The Mahabaleshwar taluka has a great potential of the development of agro-tourism centers due to the good natural and climatic conditions and different types of agro products as well as variety of rural traditions, festivals. So, it is a good opportunity to develop and agro-tourism centers in rural area of this taluka. But there is a problem of the finance and lack of proper knowledge in the farmers. Hence, the government should try to provide some financial aids and should try to give orientation about it and provide some innovative ideas regarding to the agro-tourism.

Researcher feels that the above mentioned suggestions which are based on extensive field work and careful study which would be useful and it will certainly help the agricultural development of Mahabaleshwar taluka.

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## Revitalizing Indian Villages through Pivotal Urbanization

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### Abstract

*Cities are under distress due to uncontrolled urbanization, while villages are in frustration due to inability to catch up with urban life style. A dilemma whether to continue with conventional urbanization process or to shift to reversal mode has ended in an identity crisis. Attempts of urban and rural revival remained locked in their conservative approach, which led to a strong desire of new narrative for the management of rural areas through pivotal urbanization.*

*The present paper is an attempt to suggest an integral, internal and pivotal process of up-lift of Indian villages through the amalgamation of external technologies with internal strengths, which will make Indian villages sustainable and ready for the future in social, economic and environmental perspectives.*

**Key Words:** Dream Village, Livability, Rural Transformation, Sustainable Villages, Urbanization.

### 1. Introduction:

The rate and speed of urbanization in India is very scary. If this trend continues, more people will shift towards urban centers and this will make the already stressed urban life more pathetic. Present model of urbanization is unidirectional, exploitative and world-shattering in nature and hence, cares none. It is very fast and hence vulnerable and waning. This urbanization depends on its hinterland for basic resources and cities survive only by exploiting their rural counterparts. (Sovani & Phadke, 1991)

This has not only created regional disparity, but also done no good for both rural and urban societies. There is literally a dilemma whether conventional mode of urbanization should be allowed to continue or should it be a time for revitalization. No wonder then, efforts are being made for urban renewal; but at the same time policies are looking back to make our villages better. These contradicting approaches in our processes, objectives and priorities of managing human settlements need a re-look.

### 2. Relevance of Current Urbanization Process:

Today's cities are known for their complex multi-functionality. However, according to one studies, only five types of cities which are providing services like medical, academics, financial and administration, art and entertainment and manufacturing only be promoted to grow on large scale. All other urban functions like **housekeeping, tourism, trade, residential area, transport hub, hospitality, religious centers, cultural center, etc.**, which attract many people and induce migration and urbanization must be discouraged. If one agrees to this approach, then the time has come to look back to our villages for taking care of all these activities. This approach can be a game changer.

### 3. Dichotomy between Urban and Rural Life:

Indian cities are untidy and have expanded beyond their carrying capacity. Indian cities are deprived of open space and greenery. Cities suffer from pollution and lifestyle disorders. Urban landscapes are desperately searching back their old golden days and tenable life style without compromising their materialistic gains. Urban centers are desperate to find out the remedy for the lost glory of simple life which was well supported with ecological substance. These centers are also anxious to change and make their living viable and similar to village regime but without losing their current status of progress. Urban dwellers want their life similar to village counterparts, but at the same time not ready to give up the bright side of urban gains. Indian Cities and its citizens are, in a way, trapped in identity crisis.

On the other hand, Indian villages are competing fast to catch up urban materialistic and progressive lifestyle. An unhealthy comparison with city life is ending in frustration and a feeling of

denial amongst villagers. Villages, at their local level are facing some problems like road connectivity, power supply, water availability, education facilities, housing, sanitation, lack of employment, etc.

The irony is, that people from both, rural and urban settlements are unhappy and struggling to find out the ways and means of achieving their regrettably undefined objectives.

#### 4. Need of Revitalizing Villages through Pivotal Urbanization:

Attempts are certainly being made to address the issues of rural and urban people to reduce their overall reasons of agony. The concept of smart village, for example, is based on local conditions, available resources and local requisition. But what is unfortunate is that ultimately it was expected to be a supply zone to urban areas and to act as a rural periphery to urban center. This concept is therefore, not acceptable. It is a pre stage of future urbanization and hence, it is not viable concept.

Eco Village concept focuses only on environmental and ecological up-bringing of villages (Sriraj, 2015); but remains silent on society, economy and the quality of urban lifestyle. The concept of eco-village is nothing but a 'remedial urbanization' for problematic cities under the disguise of eco-friendly lifestyle (Datta, Kundu, & Khire, 2014).

Current concept of Smart City on the other hand focuses more on overcoming the problem of housing, transportation, environmental degradation, etc. Again, this concept is pro urban and further encourages the very urbanization, and hence not acceptable solution to present dilemma.

The time has come to think some new narrative for the evolution and management of human settlements (Hung).

#### 5. Concept of Pivotal Urbanization:

Information and Communication Technology (ICT) of 1990s as a milestone is the beginning of pivotal urbanization. ICT revolution has percolated deep in the remotest areas of Indian villages. ICT has made communication virtually free, fast, universal and usable on cell phones. Distance learning modes of education are taking knowledge to the learners' doors even in remotest areas. E-Services are reducing the need of travel and cultural linkages and social media are now making societies open and liberal. Increasing literacy has brought in environmental concerns, issues and awareness at the forefront. This era is characterized by the advanced technology, and hence, rural centers have now assimilated it much easily than earlier technologies of past. Villages are now in position to find out their own capacities and capabilities from within. Villagers are no more required to chase their dreams in urban centers.

On this background it is vital to address the issue of current process of urbanization which is a universal, unidirectional process of change. This process is largely based on exploitative core-periphery theory, and resulted into uncontrolled growth of the cities, traffic jams, slums, along with social issues of disparity and urban poverty.

The reciprocal response to these issues, from some select few, was in form of reverse migration. This approach to tackle urban problems was based on the escapism, and hence, it lacked any vision and planning. Reverse Urbanization was a city specific reversal and remedial process to overcome its resultant ill effects, which was primarily based on theory of diffusion. This attempt was bound to fail as only a limited section of society and few elites could participate in this reverse trend. Thus, both conventional and reverse urbanization models could not address the basic issues.

The very concept of 'Pivotal Urbanization' is the process of ideal mix of urbanization within the rural framework. Such villages will have urban appearance well supported with global technology, but primarily will have a life with rural blend. It will not be unidirectional towards existing urban areas. Nor it will be seen as a reverse model. This concept is principally based on internal development of villages (Gupta, 2005), based on its internal strengths with external connect in essential areas of technology. Each village will act as engine of development independently.

## 6. Path to Revitalize Indian Villages through Pivotal Urbanization:

Amalgamation of external technologies either diffused from urban areas or received directly through web along with internal strengths will make Indian villages ready for the future. It will follow a principal of  $R^3$ —‘Review-Reject-Retain’ policy; where a regular review of issues will be done, all unprincipled elements would be replaced and all good things would be retained. Each Village, in due course, will attain a degree of specialization. Certain urban functions which are now needed to be transferred to villages will provide a great potential to achieve this specialization. This will be forte for its survival and sustenance. This process will work as evolutionary in nature and therefore, initially may be slow, but it will be long lasting and sustainable (Wandl & Magoni, 2017).

The sustainability of Pivotal Urbanization model hinges on Societal, Economic and Environmental aspects. Pivotal Urbanization is, therefore, ought to be aligned to these three core areas. Rather, the Pivotal Urbanization process has to plan programmes which will be socially inclusive, economically viable and environmentally tenable.

Core concept of Pivotal Urbanization model is to provide urban specific facilities in the rural environment, so that the temptation of unidirectional and exploitative urbanization is arrested at the source itself. Pivotal Urbanization process, therefore, must ensure following features of future Indian villages as a ways and means of their revitalization.

### 6.1 Social Features:

- Education and health care, which is the main attractions of urban life style, must be provided to everyone in villages. These two facilities are of great motivational value and if provided at par, it will give a sense of equity and parity with urban dwellers.
- Mobility and transportation is yet another issue of urban life style. To ensure a better mobility and transportation, even a remotest village must be made accessible (Datta), through efficient public transport network.
- There must be a limit on the horizontal and vertical growth of every village and a further growth beyond a particular limit or boundary shall not be permitted at any cost. Freedom and growth cannot be boundless and must be subjected to some regulations and restrictions.
- Future Indian Villages must follow a principle of simple, slow, steady and sustained life.
- Inclusive community life and programmes like career and family counseling, anger and stress management and such many programmes will provide a non-materialistic satisfaction to future Indian Villages.

### 6.2 Economic Features:

- Only a few built up units shall share a common wall in a row. There must be a buffer zone of some natural landscape between successive built ups. This will inevitably restrict the boundless growth of settlements.
- Priority must be given to local infrastructure and natural resources. But there shall not be a hindrance to external technologies and materials.
- Village must recycle bio waste, agro waste and domestic waste.
- Industries in villages must be allowed only if at least one basic raw material is available locally. Village industries must be involved in complete production chain and thus must produce a final ‘ready to delivery’ production. It shall not be a sub-unit or a sub-set of large industry located in any city.
- Facilities passing through the air space of villages (e.g. power grid and fly over bridges), ground space (e.g. highways) or underground space (e.g. Water and / or gas pipelines) must be shared or extended to every village on the route of those facilities.

### 6.3 Environmental Features:

- The land use pattern must be in the ratio of 80:20, where 80% land must be under natural factors and 20% can be under human usages. This includes every alteration made by man for roads, houses and other built-up areas. Maximum built up area in terms of its height shall not be more than G+1. Density of built up area and road network must be less. FSI shall also be restricted to present rate of 0.40 in villages.

- Sky line of the village must be dominated by natural landscape like hills, farms, trees and forest. Wind mills and solar panels in the sky line must be seen as a great encouragement to villagers. But, appearance of a power grids and one or two communication tower in sky line cannot be ruled out.
- Proportion of water bodies must be at least 10% of the total land area and they are ought to be multiple in numbers. In case the natural water bodies are absent, farm ponds, check dams, wells and tube wells must be built and maintain through mutual co-operative schemes. Also a mandatory underground water harvesting scheme shall also be implemented in entire village.
- There must be a solar energy panels on each and rooftop. Besides, wind mills, gobar gas or biogas plant must be functional in a ratio of at least 1:25 households.

## 7. Conclusion:

Providing urban facilities in the rural settlements without compromising its identity and blended lifestyle is the only way of revitalizing rural areas. This will reduce the temptation of unidirectional and exploitative urbanization. Pivotal Urbanization process within villages, must ensure the social, economic and environmental inclusion in all future policies of rural revival programmes.

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## Agro Tourism: Benefits And Problems

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### Introduction:-

Agriculture plays an important role in social and economic development of India. Around 70 percent of the population is directly and indirectly dependent on agriculture. Millions of farmers are dwelling in 6-25 lakh villages producing food grains for feeding the country more than profession or a business. Hence additional income generating activities to existing agriculture would certainly increase contribution of agriculture in the national GDP. Serious efforts need to be made in this direction and Agro tourism is one such activity.

The state of Maharashtra is the pioneer state to AGRI TOURISM DEVELOPMENT CORPORATION (ATDC) is established in 2005 and owns the pilot agro Tourism project of 28 acres in Palshiwadi, Tal-Baramti, Dist-pune, and 70 km from Pune city in 2007, ATDC launched training and skill development programs, first 52 farmers were selected in Maharashtra and the story continues. This agro tourism model has been replicated in 328 agro tourism centers across 30 districts in Maharashtra, which has helped to conserve, village environment, village traditions and culture, agriculture, tradition that has helped gain sustainable supplementary monthly income source and generated local employment.

### Objective of the study:-

- To study the role of agro tourism in socio-economic development.
- To study the facilities provided by agro tourism centers.
- To identify the problem of agro tourism centers.
- To study the benefits of agro tourism.

### Research methodology:-

The present study is based on secondary data. The secondary data has been collected from related research work, articles, books, newspapers and reports.

### Concept of agro tourism:-

Agro tourism is the latest concept in the India tourism industry, which is based on farms. It gives you the opportunity to experience the real enchanting and authentic contact with the rural life, test the local genuine foods and get familiar with the various farming tasks during the visit it provides people the welcome escape from the daily hectic life in the peaceful rural environment it gives the chance to relax.

The concept of agro tourism is very simple, where by the urban tourists go to the farmers home, stay like a farmer, engage in farming activities, experience the bullock cart, tractor ride, fly kites, authentic food, wear traditional clothes, understand the local culture, enjoy the folk songs and dance, buy fresh farm products and in turn the farmer maintains home and farm hygiene, greets new tourists, sells his farm produce at a better price, earns a livelihood all year round.

### Why Agro Tourism:-

India is agriculturists' country but agriculture business is becoming more unsecured due to the irregular monsoon, unsecured product pricing. Many farmers cannot afford it and have a problem, due to the agricultural problems some farmers are committed to suicide in the various districts. Hence there is need of start any of allied income source from farm.

In other side, today's urban children's world has become limited in the closed door such as school, classes, cartoon, television, video games, chocolates, soft drinks, spicy fast food, computer, internet etc. so on they see mother nature only on television screen. Now it has become very necessary that children know the traditional way of agricultural farming activities and other business dependent on agriculture. Here children have come very close to Mother Nature and learn many new things in life for a sustainable living.

### Infrastructure Facility Agro Tourism Center:-

- Accommodation facilities such as farmhouse.
- Provide cooking equipment at place for cooking as per tourist interest.
- Bullock cart, cattle shade, tractor ride etc.



- The well or lake for fishing and swimming.
- To provide typical rural food and breakfast.
- Wealthy resources in agriculture specifically water and plants at the place.
- Opportunity to participate in the rural games to the tourist.
- Green house, sericulture, goat farm.
- To arrange folk dance, shekoti, kirten, lezim, hurda party etc.
- Farmers should make availability of agro product by products to purchase to the tourist.

#### **Benefits From Agro Tourism:-**

- Agro tourism is a new source of increasing income for farmers.
- Agro tourism creates new employment opportunities for farmers and his family.
- Helping to diversity and strengthen rural economy.
- Helping preserve and revitalize local traditions art and craft.
- Increasing protection of rural landscapes and natural environment for tourist.
- Upgrading community facilities for residents and visitors.
- Agro tourism can improve the living standard of farmers.
- It supports development of agriculture and regional development.
- Agro tourism transfers social, rural cultural values between rural and urban people.
- It reduces burden of urban peoples.
- Developing new consumer market.
- Increasing the long sustainability for farm business.
- Providing a more energetic business environment.

#### **Problems of Agro Tourism Centers:-**

- Indian farmers have lack of knowledge about agro tourism.
- It is not possible to arrange all facilities from only one man. Like water, road, rest house, transport and hotel etc.
- Agro tourism, this occupation do not going to everyday. It is only going on seasonal day.
- There should be need to advertise and publicity in large scale.
- Lack of capital to develop infrastructure for agro tourism centers.
- So many farmers have small size holding low quality land.
- Farmers have to face various natural climates and consistent drought.

#### **To Promote Agro Tourism:-**

- To provides training for farmers.
- To provide local guides
- Safety
- Seasonal events
- Cultural activities
- Village festivals
- Animal rising
- Cow milking
- Rural acts and crafts
- Marketing

#### **Conclusions:-**

Agro tourism is an important and innovative agricultural activity related to tourism and agriculture both. Agro tourism educates to people and society about agriculture and rural life. It promotes local product and create added value through direct marketing. Therefore these professions get great scope. At present agro tourism business will be definitely successful.

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## Analysis of Occupational Health of Female Beedi Workers in Solapur District

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### Abstract

*The Beedi workers are poor, low income class people as a result the living environment is unhealthy, unhygienic and dirty particularly at slum areas. In last few decades especially after the year 1990, Central Government implemented new housing scheme for the beedi workers to improve their health and economic condition. This attempt of Central government was succeeded to improve their living condition and some extent to cure health problems; but not a hundred per cent. During the survey it is found that about half of the beedi workers are still lives in unhygienic condition and waiting for good houses as well as future prospects. The condition of beedi worker in state or country is not same at all places rather in study area it is also differ from place to place. The present study is geographical and addressing health issue of female beedi workers from perspective of medical geography. The present study is focusing on all possible health aspects of female beedi works of Solapur district. This work is totally based on primary data. The formal as well as informal personal interviews are conducted to collect information from doctors, female beedi works and some patients randomly from study area. The collected data is tabulated, analysis is carried out of all possible aspects and conclusion is drawn. The awareness and workers suffering from these diseases both are checked. Only 21.27% female beedi workers from beedi gharkul, 7% from Barshi and about 8% from Solapur city are in very good physical condition. About 50% per cent of the female workers are unaware about occupational diseases causing due to tobacco. Only 2.12% respondents are reported that either female beedi worker or their family member is suffering from major occupational disease like cancer. The share of TB is very less i.e. 0.24%, about 11% are having respiratory diseases and 10.24% are from heart disease. The distance of government hospital is quite long form new beedi gharkul and workers needs to travel to avail health facilities. Very few workers have knowledge of diseases and its severity. Hence health care and its literacy need to be increased among female beedi workers.*

**Keywords:** Occupational Health, Female beedi worker, Body Mass Index, Diseases, Physical health, etc.

### 1. Introduction

Solapur district is drought prone area. Major occupation of the district is agriculture, cottage industry and cotton industry. The selected study is concentrated in agro based raw material and health condition of female beedi workers in Solapur district. The Beedi workers are poor, low income class people as a result the living environment is unhealthy, unhygienic and dirty particularly at slum areas. In last few decades especially after the year 1990, Central Government implemented new housing scheme for the beedi workers to improve their health and economic condition. This attempt of Central government was succeeded to improve their living condition and some extent to cure health problems; but not a hundred per cent. During the survey it is found that about half of the beedi workers are still lives in unhygienic condition and waiting for good houses as well as future prospects. The condition of beedi worker in state or country is not same at all places rather in study area it is also differ from place to place. The health is most concerning aspect of human life. The income is essential aspect to live alive but while earning money and performing work as well as health care is also equally important. The beedi is associated with tobacco and the observations give inspiration to study the health situation of female beedi workers in study area. While conducting complete health study it is essential to focus different aspects of health systematically with methodology of medical science. The pathological testing and associated diagnostic analysis is requiring scientific medical knowledge which puts limitation to geographer. Hence in this study an attempt is made to comprehend the possible health aspects of female beedi works of Solapur district. Study area divided in to three major pockets Solapur city, Beedi Gharkul and Barshi city.

### 2. Aim And Objectives

The main aim of this study is to comprehend the Occupational Health Condition of Female Beedi Workers in Solapur District

The associated objectives of the present study are as follows:

1. To study the Occupational health of the female beedi workers.
2. To analyzed Occupational health with different indicators.

### 3. Study Area

The Solapur district is located in southern part of Maharashtra state. It is having 14,845 km<sup>2</sup> (5,732 sq mi) area and total population 4315527 as per 2011 census. The population density is 290/km<sup>2</sup> and the share of urban population is 31.83%.

### 4. Database and Methodology

The present study is based on both primary and secondary data. The primary data is collected through field work. The interview of 850 female workers conducted and data is collected. In this process the observations, discussions, interviews and questionnaires techniques are applied. The secondary data is collected from available sources like Census of India, District Socio-Economic Abstract, District Gazetteer, records from beedi employee unions, other published reports. The collected data is tabulated thereafter graphical analysis is carried out and finally interpreted the same.

### 5. Review of Literature

The Directorate General of Factory Advice Service and Labour Institute conducted a national survey (2005) on 'Occupational Health Profile of Beedi Workers and Ergonomic Interventions were of 246 samples in Maharashtra, Mangalore and Kannur with 25 samples and Jabalpur and Kanpur with 31 samples. This study highlights that incidence of health problems was high among female workers than males and particularly musculoskeletal problems, respiratory complications, eye irritation, dermatitis and malnutrition.

An exploratory study was conducted on the present condition of beedi rolling women in India in 4 states – Madhya Pradesh, Gujarat, Andhra Pradesh and Kerala for 280 beedi rolling women. The study results showed that majority of the women were suffering from hazardous health problems like backache, spondylitis, asthma, tuberculosis and miscarriage.

A study conducted by the National Institution of Occupation Health, Ahmedabad revealed that the main hazards in the beedi industry are tobacco dust, burning of the eyes, conjunctivitis, bronchitis and emphysema (Mittal et al., 2006., Sen (2007).

A survey done by Sen (2007) in Sagar district, Madhya Pradesh shows that 67.14% beedi workers experienced pain in limbs and shoulders, 62.86% reported headache while working and after that, 51.43% of workers had back pain, 44.29% had continuous cold and allergy, 20% had eye problems, 17.57% had gas trouble, and 11.13% had asthma.

Occupational exposure to tobacco or other lung irritants, such as air pollution, chemical fumes, or dusts in the working settings constitutes a significant risk of developing respiratory diseases especially Chronic Obstructive Pulmonary Disease (COPD). The World Health Organization (WHO) estimates that tobacco caused 5.4 million deaths in 2005 and 100 million deaths over the course of the 20th century.

### 6. Indicators of Occupational health

The occupational health is multi-disciplinary activity which is associated with physical, mental, and social wellbeing as general health and personal development. There are different definitions of occupational health such as:

- ❖ "The development and promotion of healthy and safe work, work environments and work organizations".
- ❖ According to WHO occupational health should aim at the promotion and maintenance of highest degree of physical, mental and social wellbeing of workers, in all occupation, the prevention among workers of departures from health caused by their working conditions, the protection of workers in their employment from risk resulting from factors adverse to health.

The major indicators of occupational health are,

- ✓ Health and working condition
- ✓ Occupational hygiene
- ✓ Occupational and other work related diseases
- ✓ Prevention of occupational diseases
- ✓ Causes of health problem of beedi workers
- ✓ Non-nutritious diet
- ✓ Protection during work
- ✓ Impact of raw material

### 6.1 Physical Health Condition Of Female Beedi Workers

The physical health is very important aspect on which work efficiency is directly or indirectly dependent. The healthy person can do work more efficiently and vice-versa.

During field work the observation method is adopted to monitor the physical health of female beedi workers. The weight and height of female beedi worker is measured same time the skin tone and black marks under eye, blood colour visible through nail, etc. are checked.

**Table No. 1**

**Physical Health Condition of Female Beedi Worker**

Present Physical Condition	Barshi	%	Solapur City	%	Beedi Gharkul	%
<b>Very Good</b>	12	7.06	19	7.98	94	21.27
<b>Good</b>	28	16.47	21	8.82	67	15.16
<b>Average Satisfactory</b>	53	31.18	85	35.71	172	38.91
<b>Poor</b>	45	26.47	69	28.99	56	12.67
<b>Very Poor</b>	32	18.82	44	18.49	53	11.99
<b>Total</b>	<b>170</b>	<b>100.00</b>	<b>238</b>	<b>100.00</b>	<b>442</b>	<b>100.00</b>

**Source:** Based on Field Work Data

Table No.1 represents the physical health condition of female beedi workers which is checked during field visit of study area. The marking is made from very poor to very good in five categories. About 75% workers from beedi gharkul is above average satisfactory level and it is 50% at Barshi and Solapur city. There are 21.27% female beedi workers from beedi gharkul, 7.06% from Barshi and 7.98% from Solapur city are in very good physical condition.

### 6.2 Body Mass Index

Body Mass Index (BMI) is a person's weight in kilograms divided by the square of height in meters. A high BMI can be an indicator of high body fatness.

**Table No.2**

**Body Mass Index Standard Range**

Category	BMI Range	BMI of Female Beedi Workers	%
<b>Morbidly Obese</b>	Above 40	13	1.53
<b>Obese</b>	27.6 to 40	42	4.94
<b>Overweight</b>	23 to 27.5	240	28.24
<b>Normal</b>	18.5 to 22.9	487	57.29
<b>Underweight</b>	15 to 18.4	61	07.18
<b>Starvation</b>	Below 14.9	07	0.82

**Source:** Based on Field Work Data

Table No. 2 represents the standard range of Body Mass Index and the figures derived for the calculation of female beedi workers BMI. Out of total surveyed samples more than half of the female beedi workers (57.29%) are in normal range.

The cases of starvation and morbidly obese is very low i.e. 0.82% and 1.53% respectively. More than 1/4<sup>th</sup> i.e. 28.24% female workers are overweight and most of them are more than age of 45 years. The main reason is they are continuously performing work by seating and their age factor. During survey 7.18% respondents are found underweight. There are different causes for underweight beedi workers and some of them are food habit, improper diet, economic crises and working condition.

### 6.3 Sanitation

The slums in Solapur city and Barshi are having different problems of sanitation particularly sewage disposal, garbage, community toilets, drainage, etc. Pore and Randive (2014) observed that due to unsafe water, inadequate sanitation and unhygienic, people suffer from allergies, and diseases. The unsafe drinking water, poor sanitation, unsanitary food preparation, garbage waste and unclean

household environment generates serious health problems which leads to causes ill health of residents particularly children residing at slums of Solapur city.

All most all beedi workers and their family members are using public toilets. The conditions of public toilets are very bad in terms of cleanness and hygiene. During field survey it is seems that people are not taking enough care to wash their hands after using toilets. The uses of hand wash soap or natural means like soil-with-ash are not practiced for washing hands.

#### 6.4 Precaution Taken During Work

The beedi rolling work is considered as hazardous work by the persecution of society. The tobacco is the dangerous to human health and beedi workers are dealing with this continuously for long time. Therefore this activity is becomes conscious for health of the beedi worker. Hence it is expected that the worker should take enough care while performing their work.

**Table No. 3**  
**Precaution Taken During Work**

Precaution Taken During Work	Respondents	%
Yes	21	2.47
No	829	97.53

**Source:** Based on field work

What precaution is beedi workers are taking during the work is checked. It is noticed that only 2.47% workers are taking some care and rest 97.53% respondents are not taking and care.

The most dangerous thing is that female beedi workers are not washing their hands properly using soap or liquid. Most of the times they just wash their hands with only water (make it wet) and perform domestic duties including preparation of food, feeding baby child, and all day to day activities. The occupational hygiene is not maintained in all surveyed sites including beedi gharkul and slum areas. In fact they are not feeling any harm towards this irresponsible behavior which is most dangerous thing.

#### 6.5 Minor Diseases

It is seen that out of total respondents 32% beedi workers are known about different diseases whereas other are totally unaware about it. In this study the awareness and workers suffering from these diseases both are considered. According to Annalakshmi, (2013) the nausea, giddiness, vomiting, headache, tiredness, loss of appetite, weakness, cough, and breathlessness are the common health problems to beedi workers.

Table No. 5 shows the distribution of female beedi workers suffering from minor diseases like backache, headache, coughing, skin irritation, eye irritation, general weakness, throat infection, etc. These minor diseases can occur to anyone from common layman to workers of any production activity. Also these problems can occur due to normal infection or it may be occupational diseases.

**Table No. 5**  
**Distribution of Respondents Suffering from Minor Diseases**

Disease Name	Never	%	Occasion	%	Regularly	%
Backache	-	-	247	29.06	603	70.94
Headache	-	-	302	35.53	548	64.47
Throat Infection	509	59.88	182	21.41	159	18.71
General weakness	21	2.47	611	71.88	218	25.65
Eye Problems / Irritation	127	14.94	649	76.35	74	8.71
Stomach Ache / Ulcer	539	63.41	283	33.29	28	3.29
Nausea and Vomiting	438	51.53	395	46.47	17	2.00
Frequent Body Ache	437	51.41	172	20.24	241	28.35
Skin Irritation	198	23.29	310	36.47	342	40.24
Coughing	92	10.82	655	77.06	103	12.12

Source: Based on field work data.



Generally it is very much difficult to understand or its segregation whether it is occupational or general. In this study the data is collected by checking the nature of diseases whether it common or occasional. The headache and backache are the common problems harassing to all cent percent female beedi workers more or less manner. The diseases like throat infection, vomiting, stomach ache, frequent body ache are not common disease and majority of workers are reported as never suffering from these diseases. The general weakness, eye irritation, and coughing are the occasionally occurring diseases.

### 6.6 Major Diseases

During survey it is noticed that people are giving information about minor diseases very frankly whereas they are not talking in fact avoiding about major diseases. They are not providing the data which is one of the limitations in analysis.

**Table No. 6**  
**Distribution of Major Diseases Suffering**  
**(To Respondent or Family member)**

Disease Name	Yes	%	No	%
Cancer	18	2.12	832	97.88
Heart Diseases	87	10.24	763	89.76
Tuberculosis (TB)	2	0.24	848	99.76
Respiratory Problems	92	10.82	758	89.18

**Source:** Based on field work data.

The collected data shows that there are four major diseases occurring to female beedi workers or their family members. But noting thing is that its percentage is below ten per cent. Only 2.12% respondents are reported that either female beedi worker or their family member is suffering from this disease. The proportion of Tb is very less i.e. 0.24%. The maximum share is of respiratory diseases i.e. 10.82% followed by heart disease (10.24%). The conducted survey shows that very less number of workers have the knowledge of these diseases and its severity. Hence it is very much necessary that health care and its literacy is needed among female beedi workers.

### 6.7 Sources Of Medical Consultation

The illness needs to be cured on priority basis without ignorance by proper doctors. The treatment of ill-health or disease is made at different levels i.e. private clinic with paying fee or in government hospital without any payment i.e. free. The treatment cost is another important issue; since beedi workers are from poor economic background they cannot afford high expenditure of treatment.

**Table No.7**  
**Sources of Medical Consultation by Female Beedi Workers**

Health Service Center	Barshi	%	Solapur City	%	Beedi Gharkul	%
Private Hospitals / Clinic	48	28.24	34	14.29	227	51.41
Government Hospitals	73	42.94	54	22.69	53	12.00
Medical Stores	33	19.41	137	57.56	124	28.12
Other Healers	16	9.41	13	5.46	37	8.47
<b>Total</b>	<b>170</b>	<b>100</b>	<b>238</b>	<b>100</b>	<b>442</b>	<b>100</b>

**Source:** Based on field work data.

The beedi gharkul is located at outskirts and needs to travel lot of distance to reach government hospital. Hence workers staying at beedi gharkul are getting treatment from private clinic (51.41%). Many times these people are orally explain the health problem to the medical store and getting medicines and avoiding visiting the hospital

### 7. Conclusion

The female beedi workers are having some issues such as : 1) The continuous work of beedi rolling is everyday routine throughout the year which is having endless working hours. 2) The straight seating position with bending neck for long hours is creating back pain and spinal problems. 3) Huge

proportion of beedi workers are staying at slums which are unhealthy, unhygienic, congested hence the houses are dark and non-ventilated. This living situation is giving invitation of various health problems. 4) The improper, insufficient and non-nutritious diet is leading to unhealthy physical condition which leads to diseases like weakness, low weight, malnutrition, etc.

About 50% per cent of the female workers are unaware about occupational diseases causing due to tobacco. About 79% per cent of beedi rolling workers are not aware of major diseases caused by beedi rolling. The female beedi workers are not wear protective clothing, or masks, and are exposed to tobacco dust directly to the worker as well as surrounding people. Only 21.27% female beedi workers from beedi gharkul, 7% from Barshi and about 8% from Solapur city are in very good physical condition.

The 28.24% female workers are overweight which are of more than 45 years on the contrary 7% respondents are found underweight. There are different causes for underweight and some of them are food habit, improper diet, economic crises and working condition.

The hygienic care is not taken by workers. Majority of people are not washing their hands after using toilets. The drinking water line is passing adjacent to open sewage and the broken water pipe line is tied with plastic or rubber. The continuous bad smelling is leading to suffocation. The garbage is dispersed around the community bins and pigs and dogs are spreading it more. The animals are moving rather staying in same slums which spreads the diseases. Only 2.47% workers are taking some care and rest 97.53% respondents are not taking and care.

About 57% respondents have accepted and agreed that the surrounding environment is leading to different diseases but same time they feel themselves helpless. The female beedi workers are not washing their hands properly after work also. Most of the times they just wash their hands with only water (make it wet) and perform domestic duties including preparation of food, feeding baby child, and all day to day activities.

The headache and backache are the common problems harassing to all cent percent female beedi workers more or less manner. The general weakness, eye irritation, and coughing are the occasionally occurring diseases.

Only 2.12% respondents are reported that either female beedi worker or their family member is suffering from major occupational disease i.e. cancer. The share of T B is very less i.e. 0.24%, about 11% are having respiratory diseases and 10.24% are from heart disease.

The distance of government hospital is quite long form new beedi gharkul and workers needs to travel to avail health facilities. Hence workers staying at beedi gharkul are getting treatment from private clinic (51.41%). Most of the times female beedi workers are not having time to visit the clinic or hospital from their busy working schedule. Hence they are orally explaining their health problem to the medical store and getting medicines and avoiding visiting the hospital.

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## Role Of Dairy Farming In Rural Development

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### Abstract

*Indian dairy sector contributes the large share in agricultural gross domestic products. Presently there are around 70,000 village dairy cooperatives across the country. The co-operative societies are federated into 170 district milk producers unions, which in turn have 22-state cooperative dairy federation. Milk production gives employment to more than 72 million dairy farmers. In terms of total production, India is the leading producer of milk in the world followed by United State of America. The milk production in 2005-06 is estimated at 97.1 million Metric Tons as compared to 192.5 million MT in the previous year. This production is expected to increase to 100mn Metric Tons by 2007- 08. Of this total produce of 89mn cows' milk constitute 56mn MT while rest is from other types cattle.*

*India is the world's largest producer of dairy products by volume and has the world's largest dairy herd. The country accounts for more than 13% of world's total milk production and is also the world's largest consumer of dairy products, consuming almost all of its own milk production. Dairying has been regarded as one of the activities that could contribute to alleviating the poverty and unemployment especially in the drought-prone and rain-fed areas. In India, about three-fourth of the population live in rural areas and about 38% of them are poor. Therefore among these people, as well as the large vegetarian segment of the country's population, dairy products provide a critical source of nutrition and animal protein to millions of people in India.*

**Keywords:** Contributes, Co-operatives, Federated, Constitute, Largest, Segment etc.

### 1. Introduction

Dairying has been a part and parcel of Indian culture and civilization from the ancient times and remains so even today. Dairy farming plays a very important role in improving the economy of the country. Milk has an important place in human diet. Dairying is one of the animal husbandry enterprise, which provide employment and products and cattle feed industry. Dairy is the place where handling of milk and milk products is done and technology has been defined as that branch of dairy science, which deals with the processing of milk and manufacture of milk products on the industrial scale. But dairy is an economic activity, which adds income to households. It provides indirect insurance against risks from crops, such as crop failure due to drought or pests. It is pertinent to study how for dairying helps the farm families to get gainful employment.

Dairy enterprise plays a very important role in the rural economy of India. It provides income and employment not only to the worker sections of the society but also to the farming community of the country in general. The return from small holdings can be maximized by the proper combination of dairy enterprises with crop production. India ranks first in number of animals and in production of milk in the world. India succeeds in producing 88.1 million tones of milk to become world's largest milk producer.

### 2. Objectives Of The Study

1. To study the contribution Dairy Farming in India.
2. To study the role of Dairy Farming in India.
3. To study the challenges of Dairy Farming in India.

### 3. Methodology Of The Study

The present study has been descriptive; the data for this study were obtained from secondary sources. The secondary data has been collected from various references which already existed in published form; part of the paper is based on literature review the method comprising of collecting all the available papers relating to the theme and selecting relevant papers/books for the review purpose. Selection of the paper is done on the basis of their relevance and contribution to the body of knowledge. The author has made an attempt to do primary reading of the selected papers which will constitute the core of this review study.

#### 4. Contribution of Dairy Farming in India

Today the average per capita availability of milk in India has reached 263 gm per day. When the world milk production in 2008 is around 700 million tones, India has produced 121.7 million tones. This was achieved due to the bovine population of 304 million (199.1 million cattle and 105.3 million buffaloes) and its strong wide spread milk procurement system established by NDDB, through the operation flood programme—15 state federations, 177 District unions and 1, 28,799 village cooperative societies.

Today, the livestock sector contribution to agriculture GDP is around 25-28%. Dairy sector contribution is around 65-70% to livestock sector. We have less than 1000 milk processing centers in India. The goals of the 11th five year plan for the livestock sector are expected to achieve an overall growth between 6% to 7% per annum for the sector as a whole and the milk production growth is estimated to 5% per annum from 100 million tones from 2008 to 126.42 million tones by 2011-12.

This increase in per capita availability is a big achievement keeping in view the huge increase in population of our country. The Indian dairy industry owes its crown of success to millions of small farmers, who have one or two cows/buffaloes, yielding 2-3 litres of milk per animal. The yields have remained quite low compared to the world standards yet they have not only survived but also flourished.

Dairying has become an important secondary source of in-come for millions of rural families and has assumed a most important role in providing employment and income generating opportunity. Indian Dairying is unique in more than one ways. Contributing about 5.3 per cent to India's agricultural GDP, milk is a leading agricultural produce. The value output from milk at current prices during 2006-07 has been over Rs.144386 crores which is higher than the output from paddy (Rs.85032 crore) alone and is also higher than the value out-put from Wheat (Rs.66721 crore) and sugarcane (Rs.28488 crore), put together. The unique feature of the system is that about 120 million rural families are engaged in milk production activities as against big specialized dairy farmers in the west. During the post independence period, progress made in dairy sector has been spectacular. Milk production has in-creased more than four folds from a mere 17 million tones during 1950-51 to 104.8 million tones in 2007-08. However, the country's per capita availability is still lower than the world's daily average of about 285 gms though it has doubled from 124 gms in 1950-51 to 256gms per day in 2007-08.

This impressive growth effort speaks volume about the coordinated efforts of large number of milk producing farmers, scientists, planners, NGO's and industry in achieving self-sufficiency in milk production. Dairy industry is of crucial importance to India. The country is the world. largest milk producer, accounting for more than 13% of world's total milk production. It is the world's largest consumer of dairy products, consuming almost 100% of its own milk production. Dairy products are a major source of cheap and nutritious food to millions of people in India and the only acceptable source of animal protein for large vegetarian segment of Indian population, particularly among the landless, small and marginal farmers and women. Dairying has been considered as one of the activities aimed at alleviating the poverty and unemployment especially in the rural areas in the rain-fed and drought-prone regions. In India, about three-fourth of the population live in rural areas and about 38% of them are poor. In 1986-87, about 73% of rural households own livestock. Small and marginal farmers account for three-quarters of these households owning livestock, raising 56% of the bovine and 66% of the sheep population.

#### 5. Role of Dairy Farming in Rural Development

Dairy industry is of crucial importance to India. The country is the worlds largest milk producer, accounting for more than 13% of worlds total milk production. It is the worlds largest consumer of dairy products, consuming almost 100% of its own milk production. Dairy products are a major source of cheap and nutritious food to millions of people in India and the only acceptable source of animal protein for large vegetarian segment of Indian population, particularly among the landless, small and marginal farmers and women. Dairying has been considered as one of the activities aimed at alleviating the poverty and unemployment especially in the rural areas in the rain-fed and drought-prone regions. In India, about three-fourth of the population live in rural areas and about 38% of them are poor. In 1986-87, about 73% of rural households own livestock. Small and marginal farmers account for three-quarters of these households owning livestock, raising 56% of the bovine and 66% of the sheep population. According to the National Sample Survey of 1993-94,



livestock sector produces regular employment to about 9.8 million persons in principal status and 8.6 million in subsidiary status, which constitute about 5% of the total work force. The progress in this sector will result in a more balanced development of the rural economy.

## 6. Conclusion

Dairy farming is a major livelihood followed by many households in rural areas. This includes rearing milk cattle—cows, buffaloes, goats and sheep. There is a shortage of milk in the country as consumption in both urban and rural areas has risen sharply. Dairying has been considered as one of the activities aimed at alleviating the poverty and unemployment, especially in the rural areas, rain-fed and drought-prone regions. In India, about three-fourth of the population lives in rural areas and about 38 per cent of them are poor. Dairying is an important source of subsidiary income to small/marginal farmers and agricultural labourers. They play a very important role in milk production of the country.

Dairy farming provides an excellent opportunity for self-employment of unemployed youth. It is also an important source of income generation to small/marginal farmers and agricultural labourers. India is one of the largest milk producers of the world. The demand of milk & milk product is increasing rapidly. There is immense scope of dairy farming in our country. The increasing cost of feed ingredients and its seasonal variability can be reduced by undertaking fodder cultivation.

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## Land Use Pattern Of Ambira Nullaha Watershed Area: A Geographical Analysis

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### Abstract

The utilization of land depends upon physical factors like topography, soil and climate as well as upon human factors such as the density of population, duration of occupation of the area, land tenure and technical levels of the people. There are spatial differences in land utilization due to the continued interplay of physical and human factors (Coppock, J. T. 1968). The watershed area of Ambira Nullaha is 6100 Hector and geographical area of the fourteen grampanchayt is 6365.8 hector. Ambira Nullaha is a small Stream of Kadvi River. It is located between 16°49'48" to 16°53'56" North latitude and 73°58'59" to 74°02'50" East longitude. The catchment area of Ambira Nullaha receives 3000 mm to 4000 mm rainfall. The 4423.6 hector area is net sown area out of these only four per cent area under Irrigation. In this research paper village wise land use pattern of Ambira Nullaha watershed area is briefly analyzed.

Keywords: Watershed area, Land use pattern.

### Introduction

The layout or arrangement of the uses of the land is known as 'land use pattern'. The land may be used for agriculture, forest, pasture etc. Land use is determined by many physical factors as well as cultural factors. The land use pattern in the Village Directory conforms to the pattern of classification of land use as recommended by the Ministry of Agriculture, Government of India. The Ministry has recommended the maintenance of records of land use pattern under the following nine categories viz. forests, area under non-agricultural use, barren and un-cultivable land, permanent pastures and other grazing lands, land under miscellaneous tree crops, etc, cultivable waste land, fallow lands other than current fallows, current fallows, net area sown. The out of total geographical area of 6365.8 hector 4423.6 hector is under net sown area and out of the net sown area only 4 percent area is under Irrigation. In this research paper village wise land use pattern of Ambira Nullaha watershed area is briefly analyzed.

### Study Area

Ambira Nullah is a seasonal sub stream of Kadvi river occupying part of fourteen villages in Bambavde circle of Shahuwadi tahsil. It located between 16°49'48" to 16°53'56" North latitude and 73°58'59" to 74°02'50" East longitude is selected as a study area. It covers about 6365.8 hector area and flowing from South-west to North-east direction. Ambira nullaha is originated at the height of 910 mt. of the south-west in the Panhala hill ranges

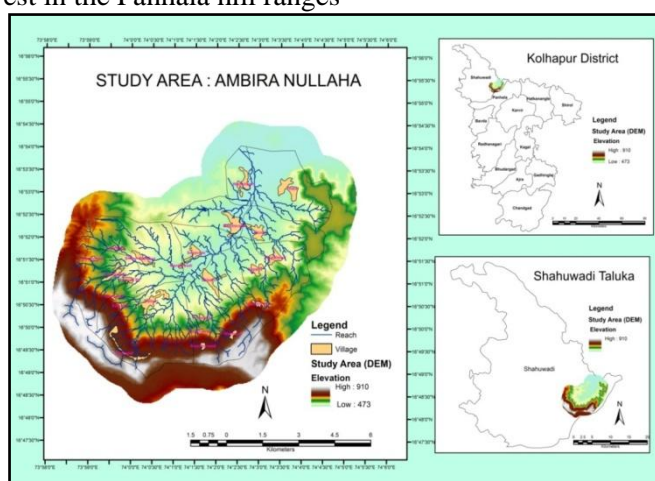


Fig. No 1

The fourteen villages are located in ambira nullaha catchment area which administratively comes in Banbavde circles. The Kadvi River is located outside of Northern part of study area near Sarud Village and Southern part of study area surrounded by Masai dongar plateau of Panhala hill

ranges. Parkhandale, Shittur, Pimplewadi, Savarde Kh., Gamewadi and Kelewadi are the hamlets and villages located in Western hilly region. In Southern part Khotwadi, Pishvi, Bhoslewadi, Powarwadi, Kumbharwadi, Warewadi and Hanmantwadi the hamlets and villages are also located in hilly area. Salshi, Supatre, Khutalwadi, Mankarwadi, Sonavde, Bambavde, Charan, Donoli and Wadicharan are the hamlets and villages located in the foot hill region of the plateau.

### Objective

1. To delineate watershed area of Ambira Nullaha.
2. To study Agricultural Land Use Pattern of selected villages of Ambira nullaha watershed area.

### Database and Methodology

For the present study primary data is collected by visiting villages and field work study. GPS instrument is used for locational information. Secondary data is collected from grampanchayat records, topographical maps, Kolhapur district census handbook etc. Collocated data is presented and analysed by using Google earth image and by using QGIS swat analysis tool.

### Result and Discussion

#### Ambira Nullaha Watershed Area

The table no 1 reveals that distribution of Ambira Nullaha watershed area. In the study area there are fourteen Grampanchayats, the total area according to political boundaries is 6365.8 hector. Out of this 6100 hector area is a watershed area of Ambira Nullaha. Ambira Nullaha watershed area is divided into four minor watersheds viz. Pishavi – Khotwadi (1100 hector), Parkhandale – Shittur (1800 hector), Warewadi – Salshi (1800 hector) and Khutalwadi – Charan (1400 hector). The stream length of Ambira Nullaha is 213 Km.

Table No: 1

Distribution of Minor Watershed Area of Ambira Nullaha

Name of Watershed	Nullaha Basin Area (in hector)	Total Streams Length (in Km)	Benefited Villages
Pishavi - Khatwadi	1100	40	Pishavi, Khatwadi, Bhoslewadi
Parkhandale - Shittur	1800	64	Parkhandale, Shittur, Pimplewadi, Savarde Kh., Gamewadi, Kelwadi
Warewadi - Salashi	1800	65	Warewadi, Salashi, Sonavade, Supatre, Hanmantwadi, Kumbharwadi, Powarwadi, Manakarwadi, Bambavade
Khatwadi - Charan	1400	44	Khatwadi, Charan, Donoli, Wadicharan
Ambira Nullaha	6100	213	Ambira Nullaha

Source: Compiled by researcher

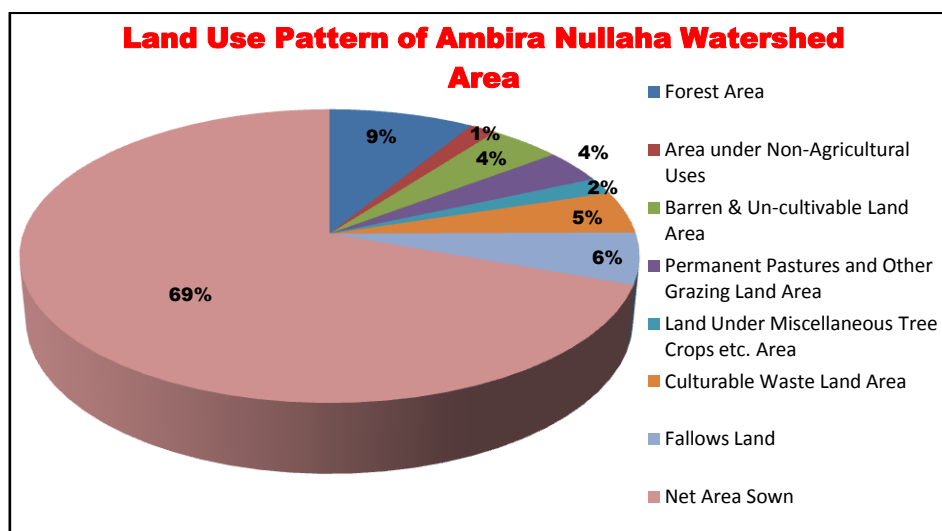
### Land Use Pattern of Ambira Nullaha Catchment Area

The table no and fig no 2 show the distribution of land use pattern in the study area. The layout or arrangement of the uses of the land is known as 'land use pattern'.

**Table No: 2**  
**Land Use Pattern of Ambira Nullaha: 2011 (Area in Hector)**

Village Name	Total Geog. Area	Forest Area	Area under Non-Agricultural Uses	Barren & Uncultivable Land Area	Permanent Pastures and Other Grazing Land Area	Land Under Miscellaneous Tree Crops etc. Area	Culturable Waste Land Area	Fallow Land	Net Area Sown
Wadicharan	237.14	0	2	45.53	3.13	0	0.48	0	186
Charan	765.37	178.94	2	46.83	25.62	0	50	25.02	436.96
Shittur Tarf Malkapur	666	0	2	20	11	70	80	80	403
Sonavade	382	0	55	0	0	0	9	0	318
Bambavade	368.01	0	3.3	0	29.81	0	0	6.74	328.16
Donoli	328.68	0	2	15.72	66.01	0	0	0	244.95
Khutalwadi	218.51	0	2	8.4	15.87	0	0	0	192.24
Supatre	466	56	2	28	14	0	10	59	297
Warewadi	326	63	2	8	0	0	0	5	248
Salashi	695	0	22	37.38	8.44	6.42	8.1	115	497.66
Pishavi	696.09	0	2	24.36	13.62	0	23.65	0	632.46
Khotwadi	442	49.84	2	21.39	6	0	42.6	0	320.17
Savarde Bk.	235	69	2	6	12	0	4	14	128
Parkhandale	540	141	2	15	27	40	70	54	191
<b>Total</b>	<b>6365.8</b>	<b>557.78</b>	<b>102.3</b>	<b>276.61</b>	<b>232.5</b>	<b>116.42</b>	<b>297.83</b>	<b>358.76</b>	<b>4423.6</b>

Source: District Census Handbook 2011



**Fig. No.2**

The land may be used for agriculture, forest, pasture etc. Land use is determined by many factors like relief features, climate, soil, density of population, technical and socio-economic factors. According to 2011 district census handbook of the Kolhapur district study area occupies 4423.6 hector of land under the net sown area; these is 69 per cent of total geographical area. Within the net

sown area 4244.29 hector area is not came under irrigation it means that only 4.05 per cent net sown area is irrigated. If we compeer the net sown area of different villages only four villages are having more than 400 hectors net sown area namely Pishvi 632.46 hector, 497.66 hector in Salshi, 436.96 in Charan and 403 hector in Shittur Tarf Malkapur etc. The lowest net sown area is found in Savarde Bk which is 128 hector. Considering the area under forest is 557.78 hector which is 9 per cent to total geographical area. The highest forest area is found in the village Charan which is 178.94 hector, followed by Parkhandale 141 hector, Savarde Bk 69 hector, Varewadi 63 hector, Supatre 56 hector and 49.84 hector Khotwadi Village. The villages namely Shittur, Sonavde, Bambavde, Donoli, Kotalwadi, Salshi and Pishvi have no forest area.

Fallow land categories occupies 358.76 hector land which is 6 per cent to total geographical area. The highest fallow land found in Salshi which is 115 hectors followed by 80 hectors in Shittur Tarf Malkapur, 59 hectors in Supatre and 54 hectors in Parkhandale village. The 5 per cent land is found in culturable waste land categories which is 297.83 hector in total geographical area. In other categories viz. barren & un-cultivable land 276.61 (4 per cent) hector, permanent pastures and other grazing land 232.5 (4 per cent) hector, land under miscellaneous tree crops 116.42 (2 per cent) hector and 102.3 (1 per cent) hector area under non-agricultural uses in total geographical area.

### Conclusion

1. The total geographical area of study region is 6365.8 hector out of these 4423.6 hector (69.49 Per cent) area under the category of net sown area. within the net sown area 4244.29 (95.94 Per cent) hector lands is not under irrigation, only 179.41 (4.05 Per cent) hector land under irrigation.
2. The largest area under irrigation is found in Charan which is 138.96 hector and after that 23.45 hector in Wadicharan village because of nearness of Kadvi River and irrigation facilities.
3. The highest net sown area found in Pishvi which is 632.46 hector followed by 497.66 hector in Salshi, 436.96 in Charan and 403 hector in Shittur Tarf Malkapur. Most of the cultivated area is under dry framing and lack of irrigation facilities because scarcity of water in dry season.
4. The watershed area of Ambira nullaha is 6100 hector and total sub stream length of nullaha is 213 km in total watershed area. Ambira nullaha is surrounded by hilly region and receives 3000 to 4000 mm rainfall in rainy season.
5. Most of the land of study area can be brought under irrigated cultivation if the government properly implement and observe watershed management scheme.

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## Issues and Problems in Agricultural Development: A Study on the Farmers of Beed & Parbhani District In Maharashtra.

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### Abstract

*Agricultural Sector, world over, has experienced a phenomenal growth since the mid- twentieth century. The growth, driven by Green Revolution technology, has made a significant dent on aggregate supply of food grains, ensuring food security to the growing population. The next stage of growth however, faces a serious challenge in terms of issues and problems in agricultural development in India.*

*India can safely be characterized as an agricultural country despite the recent spurt in manufacturing and services and the declining share of agriculture in the national income, since majority of its workforce (65%) are still engaged in agriculture and allied activities. In the present paper the issues and problems in agricultural development in Beed & Parbhani districts and also highlights on the problems of the farmers for sustainable agriculture development has been emphasized. Problems and issues for agriculture, farming and possible actions discussed.*

**Key words :-** agricultural development, technology , population, farming etc.

### Introduction

Agricultural development is one of the most talked about issues as a major portion of our population is still engaged with the agricultural industry. The widespread modernization of agriculture, development of many modern techniques and improvement in farm productivity all are the basic characteristics of agricultural development (CSSC, 1974; Bhalla & Tyagi, 1989).

Due to this reason most of the strategies of development even with its focus on different domains often emphasize upon rapid agricultural development in general and its modernisation in particular. The prime economic objective of agricultural development is to contribute to increased per capita incomes. Moreover, agricultural development promotes the proper conditions for farming so that planting, harvesting and processing of crops can be done effectively, which ultimately can reduce poverty and save lives (Mellor, 1966). Undoubtedly, such an approach has brought change in today's agricultural practices.

Quite naturally a number of studies have been undertaken to understand the issues and problems of agricultural development (De walt, 1994; Antweiler, 1998; Purcell, 1998; Sillitoe, 1998; Martin et. al., 2002; Sillitoe et. al. 2004; Ellen, 2006). Moreover, many researchers (Hendy, 2000; Berrigan, 1979; Engel and Salomon, 1997) are also concerned with the topic of sustainable agricultural development and sustainable farming systems. The discipline of anthropology has also played a significant role in understanding the emerging issue of modernisation of agriculture.

The situation in Maharashtra is not much different. A high percentage of farmers in Maharashtra are small and their farm or land sizes are little in size. They fully depend upon the agriculture. These people often sale their produces for earning livelihood and supporting their families. In addition, large numbers of farmer families depend on agricultural products for daily nourishment. Farmers in the State of Maharashtra try to use many modern technologies to improve their farming. But, they face many problems in the application of modern farming techniques. Because, these rural farmers have no knowledge regarding modern farming techniques on the one side, on the other side, they have no such amount of money to accumulate modern inputs of farming.

To overcome these problems most of the farmers in the State of Maharashtra use their traditional or local knowledge in association with modern techniques to fulfill their farming activities.

### Objectives, Methods and Study Areas

The present study attempts to investigate issues and problems of agricultural development among the farmers in the State of Maharashtra. It tries to explore how various factors of modernisation and development affect both life and agricultural economy of the farmers in Maharashtra, so that it can provide some glimpses regarding how farmers use their local knowledge and information to keep pace with the overall agricultural development of the country and the state.

The present study purposively selected farmers of the Two districts in Maharashtra i.e. Beed & Parbhani who are primarily engaged with the cultivation of cotton and other crops like Jowar, Wheat, Groundnut & Tur. These two districts have been selected on the basis of pattern of land holdings, soil, climate, crop varieties, mixed crop cultivation, market orientation research and labor pattern.

The district Beed is better known for its predominant sugar cane workers and agricultural activities in comparison to other Districts. From this region, Sugarcane, cotton is cultivated and sold in near by districts within the state and even in the neighboring state. Nearly all the varieties are produced in this region, which can be primarily classified into three types depending on the cultivated seasons like autumn cotton, winter Jowar, Wheat or Tur and summer some time sugar cane. These three seasons are named according to the season of harvest of the crop.

The sowing time of summer cotton is June & July and harvesting time is September to March. The District Parbhani is predominantly an agricultural district where cotton and sugarcane is the principal crop. Besides, different crops like groundnut, wheat, jowar, bajra and tur are produced here in large quantity. Aquaculture farming has been taken up in a big way in this belt.

The agricultural economy of this region mainly depends on the cultivation of different cash crops like Cotton, sugarcane, Tur and vegetables. Parbhani District is also famous for cotton production and cotton industry. Other important industries of the District Beed & Parbhani are the Sugarcane industry and a Cement factory.

The agriculture mainly supports the local rural economy. A considerable amount of people draw their livelihood from the agricultural sector. A large number of populations of this District depend on farming. These district are very famous for cotton and sugarcane producing region of Maharashtra.

Various standard research methods like Observation, Case Studies, Focussed Group Discussion have been used for the purpose of collection of data for this study. Farmers from each of these Districts consulted to understand their practices of crop farming and especially emerging problems and issues around different crops. Particular cases have been taken to understand local agricultural practices, development of agriculture, problems of the farmers and how they make an impact upon the life of the farmers. Moreover, Focused Group Discussion has been used to understand how these farmers try to solve their problem through their appraisal, analysis and plans.

### **Emerging Issues and Problems**

The emerging issues of agriculture in Maharashtra begin with the problem of agricultural and rural infrastructure. The problem of agricultural infrastructure includes problem of irrigation, soil conservation, and soil testing services. Besides, it also includes problem of land, labor, capital, modern agricultural inputs and preservation. The other major problems faced by the farmers of the State include environmental problem, and problem of production, production costs, problem of market infrastructure and price fluctuations. On the other hand, farmers of our State also face different difficulties due to the development of modern agricultural technologies.

#### **Problem of Irrigation**

Irrigation is an important problem among the all farmers in every villages of Beed & Parbhani district in Maharashtra. For example, Beed district farmers in the Parli and sirsala region cultivate sugarcane and other crop once in a year which is in the rainy season because of limited water sources.

There is no Governmental facility for irrigation in all the farming villages. District farmers in the Parbhani, Jintur, Manwat region have personal mini pump for irrigation. Some farmers use tulu or shallow pump in their pond to fulfill their irrigation activities. They do not get any help from the Government in such cases. Due to the development of modern irrigation techniques nowadays farmers in the beed & Parbhani region face a number of new problems which include power failure; high diesel price; and occasional unavailability of diesel.

#### **Problem of Labour**

Labour demand is adversely affected by the mechanisation process. Employment was gradually being displaced by the increased mechanisation of agriculture in the villages. The labor required for operating various activities relating to the major crops such as cotton, sugarcane, groundnut, jowar and tur declined over time. Besides, machines are also being used in other operations such as carrying, threshing etc. which considerably curtailed the labor requirement for a

range of post harvest operations in the village. This in turn results in unemployment of those laborers who are traditionally engaged to this profession.

### Conclusion

The above discussion of different local difficulties among the farmers of Maharashtra has raised a number of important issues. These issues are vital for real development of agricultural situation and the farmers of our State.

Present study further reinstates the realities of developmental policy involving agriculture and their actual implementation at grass root level. This study has identified that Maharashtra farmers prefer to cultivate staple food crops, followed by accompanying food crops and lastly pure profitable crops. On average, farmers produce three different crops per year such as staple i.e. Cotton ; accompanying i.e. Jowar and various green vegetables and pure profitable crops i.e. flower, Bajra, groundnut, Tur and Soyabean.

These crops are dominant, profitable and having market demand in several regions of the State. Therefore farmers of the state prefer to cultivate these lucrative crops. Conversely, they cultivate cotton only for economical growth. As a result cotton cultivation is moderate in all over the State. Then again, there are some other reasons behind the decrease of sugarcane cultivation. For example, the occurrence of drought in the some sugarcane growing areas affect low production every year. Beed and Parbhani district regions are the most drought affected region. In every year a natural disastrous occur in these areas which affect all the villages and destroy agricultural land, livestock, farming constitution and life of the farmers. In addition, farmers of the some region fail to cultivate cotton and sugarcane due to lack of irrigation like Ambajogai, Parli, Sirsala taluka of Beed. Finally, on top of all that, the increasing cost of production on one hand, and decreasing farm gate prices on the other, have caused many farmers to stop farming due to marginalisation of net farm returns. Precisely, this Study has noticed that farmers of Beed & Parbhani district in Maharashtra need many supports for improvements of farming systems.

Studied farmers consider that the low prices, low profits and volatile markets of commodity crops are greater problem than climate variability, because crops do better with irrigation than with rain. Therefore, Governmental supports regarding above said farming problems are immediately required. On the other hand, the developmental efforts in farming system are required with effective participation of varied sections of farmers in the State.

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## A Study On The Role And Participation Of Women In Agriculture Development

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### Abstract

*The changing status and position of women and the role of women in agriculture development is an important field for intensive research in the recent period. In this paper an attempt has been made to study the several determinants which may affect participation of women in agricultural activities directly or indirectly, and come out with strategies which can be implemented to improve the participation of women in agricultural activities. Agriculture is the back of Indian economy. The economy growth of our country depends largely on the prosperity of agriculture. The source of exploitation and disabilities of women are rooted in their ignorance. Helpless, Landlessness, lack of education and inequality in such a long magnitude they have not been activity involved in the main stream of development and there is hardly any appreciation and recognition of their extensive contribution.*

#### Objectives of the study:

1. To Understand role and Participation of Women in Agriculture Development
2. To Study determinants of Women participation in agriculture.
3. To understand strategies for better participation of women in Agriculture.

#### Methodology of the study:

*Keeping in view the specific objectives the Study analyses role and participation of Women in Agriculture Development. The study is mainly based on secondary sources of data collected from various magazines, Books, Journals, News Papers, and Articles.*

### Introduction

The historians believe that it was women who first domesticated crop plants and there by initiated the art and science of farming Women have played and continue to play a key-role in the conservation of basic life support system such as land, Water, Flora, Fauna, Without the total intellectual and management to shifting cultivation, arrest gene and soil erosion and promote the care of the so Hand health of economic plants and farm animals (swaminathan,1985).

Irrespective of the different rates of women work participation in development and developing countries, there is a general agreement that they are subjected to labor market discrimination and segregated to low paying and low status -jobs, which leads to marginalizing the economic role of women in the process of development (Varghese,1993). Since 1990 women's have identified as key agents of sustainable The World Bank has suggested that empowerment of women should be a key aspect of all social development programs (World Bank, 200).

In this back drop, an attempt has been made to discuss the issues related present position & Participation, determinants of women participation in agriculture, gender discrimination, mechanism and suggestion for better utilization of women population in agricultural activities and development.

### Participation Of Women In Agriculture

The role of women in the agricultural and economic development of country can hardly be ignored but their economic activity outside the home is contingent upon various factors like economic need, educational attainments, husband-'s status, availability of job opportunities and family obligations as well as the attitudes and the value of the community towards giant full employment of women. It is because of this reason that participation rates of women in the labor force are lower than men in most of the countries of the world (Singh, 1980).

The face of the Indian farmer is a woman's face. The women farmer is the kingpin of agriculture. Not just a secondary helper. She is the major partner, Agriculture, which is the largest sector for employment. And further has most women workers, needs to come centre stage, because on the health and prosperity of this sector lies the well being of our economy society (Krishna raj and Shah, 2004). As Men's participation in agriculture declines, the role of women agriculture production increases (Emmy Simpsons, 2002).

### Determinants Of Women Participation In Agriculture

Neoclassical economic theory suggests that female's labor supply to agriculture is not only a function of her own market wage offer (substitution effect), but also a function of her family welfare



(income effect). Thus, a family is an economic agent which maximizes its welfare subject to time to time and budget constraints. Each individual within the family must choose between work in the market, at home and leisure to maximize a utility (Groan, 1980).

### **Gender Discrimination:**

In the gender based segmentation of labor force some activities are generally restricted to men and others to women. Agricultural activities are often termed as men's job and house-work as women's job. In agricultural systems, the roles, Rights and Responsibilities of men and women who farm. Differ according to geographical and cultural context. In male dominated society like ours men are assigned those types of work which have a direct exchange value and therefore the work of men is considered less prestigious in the social hierarchy. Thus, it may be said that culture determines gender appropriate characteristic in the allocation of work tasks (Raj Mohan Seth, 1991). In the countries like India, occupationally there is no balance between male and female members.

Agricultural development programs are usually planned by men and aimed at men. Mechanization, for example alleviates the burden of tasks that are traditionally men's responsibility leaving women's burdens unrelieved and even increased, all agricultural services still have sectors biased in favor of men, for instance, group discussion meetings are usually held in villages involving mostly men, further, the venue and timing of such meetings are inconvenient to women and hence even most needy women are not able to attend, and is similar in the case of training.

**Technology transfer:** Women's participation in agriculture is adversely affected by modern methods of cultivation, which results in gradual displacement of women and shrinking of their activities. Most of the agricultural development programs are planned even today by men for men. As and when technologies developed, they were focused towards male farmers, and the development and encasement of capabilities of farm women are rarely the consideration. There is a clear bias in research on technology in favor of males. Technological change in agriculture as a result in decreasing employment opportunities and displacement of women workers from agricultural activities. Technology itself can create gender barriers. There is anecdotal evidence that pesticide packs are typically too large for women to carry. And that foot pedals in tractors are not designed for use by women. Besides some of the new technologies have displaced women from many traditional activities. Such women try to take up in a work available to them e.g. road construction forest produce collection etc. At times they are subjected to verbal or sexual abuse or physical harassment.

**Non-availability of loans:** Financial institutions are hesitant to extend credit for agricultural activities taken up by women as they lack security. At the same time women are unaware of the existing credit facilities. Physically unable to reach the banks. unfamiliar with policies and cumbersome procedures. Moreover, there is lack of women's groups or cooperatives which may help women in obtaining the required credit (Sharma, 2000).

**Off-season Problems:** During off-season the women in agriculture have to struggle hard to find alternative sources of income, the absence of alternative opportunities for employment in the rural sector is intensified by the decline of traditional handicraft.

**Other factors:** About 90% of rural women are unskilled and 80% are illiterate, which makes them vulnerable to exploitation. Low level of nutrition and frequent pregnancies make them prone to poor health and thus limiting their productivity. If the number of children is large, the female participation is likely to be low; if the family size is big, the participation by women may be more, if the age distribution is in favor of adult women or the sex ratio is favoring women, relatively more females may participate in agriculture work.

### **Impact of Technology and Mechanization:**

Technology is central to accelerating agricultural growth. Realizing the benefits of technology and innovation will require: working with poor farmers to identify and tackle their key problems, develop a range of new technologies and practices and enable farmers to hear about, choose from and obtain appropriate new and existing technologies.

The role of women in technical development in agriculture has been receiving special attention only in recent years. Agriculture, food processing, composting technology, mushroom technology, medicinal plants, sericulture, poultry, aquaculture, dairy and animal rearing are the main areas in which transfer of technology into women hands can raise the level of productivity. Though the technical development during initial stages of green revolution had resulted in a decrease in women involvement, the transfer of technology into women hands is an important approach to bring them back into the mainstream.



Making Science and Technology Work for Women Farmers: Investments in science and technology drive agricultural development. The application of modern science to the agricultural sector raises factor productivity more than similar investments in the industrial sector. Some examples of making science and technology work for rural women are; development of improved crop varieties, appropriate technology for production and processing and appropriate technology for irrigation.

The following suggestions and strategic plans may help in better participation women in agriculture.

- Women's programmers must recognize the balance, which exists in the workloads and working conditions of men and women. Many programmers designed for women neglect the already heavy burden of the work they carry.
- First of all recognize women's role as farmers and producers of crops and live stocks; as users of technology; as active agents in marketing; processing and storage of food and as agricultural laborer. Secondly, asses the needs of women farmers and provide agricultural support services such as input support, technological support and extension support.
- Provide adequate organizational and financial support to the women groups to make them **"Self-help-Viable-Units"**.
- The important requirement for effective integration of rural farm women into the stream of development is to build their access to resource base, such as land and other movable properties.
- Support women-managed rural production and marketing ventures in horticulture, floriculture and post-harvest processing in commodities. Provide training and input support to take advantage of emerging high-value agribusiness sector including biotechnology and forest products.
- Agricultural education institutions and training centers should develop regular curricula and provide technical training in agriculture and allied sectors to help women farmer take up a vocation in agriculture and allied sector. Also training in increased managerial organization entrepreneurial and decision-making skills.

### Conclusions

Women in agriculture have vast potential. intelligence and ability, which if trapped properly, may enable them to join the mainstream of agriculture development. The source of exploitation and disabilities of these women are rooted in their ignorance, helplessness, landlessness, lack of education and inequality of status. It is, therefore, necessary to equip women with required information, knowledge and skills to enable them to do their work efficiently and became equal partners in agricultural production.

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## **Agriculture : Backbone Of Indian Economy**

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### **Introduction**

Agriculture plays a vital role in Indian economy. Basically India is agriculture country. Near about 70 percent people are engaged in agricultural sector and they live in rural area and villages. The main source of their livelihood is agriculture and allied activities. India is the second most populated country compared to other countries in the world. Nearly 17 percent population of the world resides in India. Similarly, various developing countries of the world are also engaged in agricultural sector. It shows that agriculture is backbone of the developing countries like India and other developing countries of the world.

Agriculture provides livelihood to 70 percent of the India's population. Besides that this sector supplies raw material to the Indian industry. India has 328.7 million hectares of geographical area, out of that 141 million hectares of area useful for cultivation. There are 60 varieties of soil noticed in India. Because of that various types of food grains are produced in the country. It is good achievement of the Indian economy.

### **Nature of Indian Agriculture**

At the time of independence, India was backward in agriculture. Productivity per hectare was extremely low. Techniques of farming were old and traditional.

Because of low productivity, agriculture merely provided subsistence to the farmers and not for commercialized. Near about 45 percent of total consumption of farmers came from their own production in 1951-52. It shows that there was low importance of money in the village economy. The above situation describes the nature of agriculture in India.

However, now a days, situation has changed. Farmers are adopting the new techniques of farming. Government motivates them for better utilization of land resources and provides irrigation, electricity and other facilities. Agriculture loan and support for allied activities of agriculture like dairy, cattle farming, floriculture etc. is rendered by the Govt. Hence, the nature of Indian agriculture is totally changed in a good manner.

### **Research Methodology**

The research paper is mainly based on secondary data collected from various reference books, journals and websites. The primary observations of the Researcher are recorded on the analysis of the data.

### **Objective**

1. To study the role of agriculture in Indian economy.
2. To study the obstacles in Agricultural development.
3. To study the agriculture as a source of National income.

### **Importance of Agriculture and Economic Development**

Agriculture is the backbone of our economic system. It provides food and raw material to various industries such as sugar, oil, jute, food etc. It also provides employment to a very large proportion of population.

#### **• Source of Livelihood**

The main occupation of Indian people is agriculture. About 70 percent of our population is directly engaged in agriculture. In developed countries this ratio is very small for e.g. in U.K. 4 percent, U.S.A. 16 percent, Australia 14 percent etc. Due to non-agricultural activities, India has not been developed to absorb the rapidly growing population.

#### **• Supply of Food and Fodder**

Agriculture provides fodder to animals and these animals in turn provide food to people in form of milk and meat. Therefore, in recent years, import of food grains has been very small.

- **Marketable Surplus**

The better development of agricultural sector leads to marketable surplus. In developed countries more and more people are engaged in manufacturing and other non-agricultural sector. All those people depended upon the other countries for food grains production, which they cannot meet their needs from their own food grains production. If agricultural development takes place, then marketable surplus increases. This can be sold to other countries. It is happening in case of India. India produce more food grains and export to other countries.

- **Source of Raw Material**

Agricultural sector provides raw materials to the leading industries like sugar, cotton, jute, tobacco, oil seeds (edible and non-edible oils) etc. As well as many other units like processing of fruits and vegetables, dal, milling, rice husking, gur making etc. all these depend directly on agricultural for their raw material.

- **Importance of International Trade**

Agricultural sector boosts to increase the International trade. India exports agricultural products like tea, sugar, rice, spices etc. Day by day, agricultural production is increasing in large quantity.

- **Source of Government Income**

In India, State Government get sizable revenue from the agriculture sector in the form of land revenue, agricultural income tax, irrigation tax and some other types of taxes are being levied by the State Government. As well as, by a way of excise duty and export duty on agricultural products government earns a large amount of revenue.

- **Overall Economic Development**

Majority of Indian people are working in agriculture sector. It show the rise in the level of national income and standard of living of the common man. The rapid rate of growth helps in agriculture economic development. It also helps to create proper atmosphere for overall economic development of the country.

If it happens continuously, then exports increase and import is reduced considerably. It helps to reduce the adverse balance of payments and save our foreign exchange. That amount can be utilized to import of raw materials, machinery and other goods. It promotes economic development of the country.

- **Employment Opportunities**

With the fast growing population and high incidence of unemployment and disguised unemployment in India, it is only sector which provides more and more employment chances to the labour force. Therefore, agricultural sector has become more significant.

- **Source of Saving**

It is seen that, after the green revolution, rich farmers have started saving from their surplus amount. This amount can be invested in agriculture sector for further development of the sector. It is essential for better development of the country.

While knowing the importance of agriculture sector, we came to the point that "Agriculture is backbone of Indian Economy". The table below provides data of contribution of agriculture in economic development.

### Agricultural Production in Five Years Plane

Crop	1950-51	First F.Y.P. (1951-56) (Average)	First F.Y.P. (1951-56) (Average)	First F.Y.P. (1951-56) (Average)	First F.Y.P. (1951-56) (Average)	First F.Y.P. (1951-56) (Average)	First F.Y.P. (1951-56) (Average)	First F.Y.P. (1951-56) (Average)	First F.Y.P. (1951-56) (Average)	First F.Y.P. (1951-56) (Average)	First F.Y.P. (1951-56) (Average)	First F.Y.P. (1951-56) (Average)	2015-16	2016-17
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Rice	20.6	25.0	30.3	35.1	41.8	47.3	65.1	78.7	87.3	85.6	97.3	106.4	104.4	110.2
Wheat	6.4	7.9	9.7	11.1	25.4	29.8	48.3	62.9	71.3	70.2	84.4	93.3	92.3	98.4
Jowar	5.5	7.5	8.7	8.8	8.3	10.8	10.9	10.7	7.9	7.2	7.0	5.0	4.2	4.6
Bajra	2.6	3.4	3.4	3.9	6.0	5.0	5.2	6.7	7.1	8.2	9.2	9.0	8.1	9.8
Maize	1.7	2.7	3.6	4.6	6.1	6.3	7.6	9.8	11.6	14.0	19.8	23.9	22.6	26.3
Other Cereals	6.1	6.6	6.5	6.3	6.4	7.1	5.4	4.9	4.5	3.6	4.0	3.8	3.6	3.4
Pulses	8.4	10.1	11.7	11.1	10.9	11.7	12.5	13.3	13.1	13.3	15.9	18.8	16.4	23.0
<b>Total Foodgrains</b>	<b>50.8</b>	<b>63.2</b>	<b>74.0</b>	<b>81.0</b>	<b>103.0</b>	<b>118.1</b>	<b>155.0</b>	<b>189.0</b>	<b>202.9</b>	<b>202.2</b>	<b>237.4</b>	<b>260.3</b>	<b>251.5</b>	<b>275.7</b>
Oilseeds	6.2	5.5	6.7	7.3	8.3	8.9	13.9	21.9	21.2	23.2	28.9	29.7	25.5	32.1
Sugarcane	57.1	55.3	80.3	109.2	128.1	153.3	196.4	258.4	292.4	277.0	325.9	342.1	348.4	306.7
Cotton	3.0	3.9	4.8	5.4	5.9	6.8	8.4	12.2	10.8	16.1	28.1	33.6	30.0	33.1
Jute	3.3	3.9	4.4	5.7	5.5	5.2	8.9	8.1	9.6	10.1	10.3	10.4	9.9	10.1

Above table shows that agricultural production during the five years plan i.e. 1950-51 to 2016-2017 of some of the major food grains, oilseeds, sugarcane, cotton and jute. It shows that there are two major food grains i.e. Rice and wheat. Production of those food grains has increased from first five year plan to Twelfth five year plan. The production of rice in first five year plan was 20.6 million tones. In Twelfth five years plan in touched the record level of 110.2 million tones. As well as production of wheat, jower, Bajra, maize other cereals and pulses has increased substantially.

The total production of food grains in first year plan was 50.8 million tones and in twelfth five year plan it was 275.7 million tones. It shows that productivity of food grains has increased vastly. In same manner, productivity of oilseeds, sugarcane, cotton, jute has increased. It happens only when there is development in agricultural sector. This sector provides food grains to people and raw material to industries.

#### Obstacles

Though Indian agriculture is developed and developing in good manner, there are some obstacle in the progress of Indian agriculture development.

- **Social Environment**

The social environment of villages is an obstacle in agricultural development. Farmers are illiterate, superstitions and unresponsive to new agriculture techniques.

- **Pressure of Population on Land**

There is heavy pressure of population on land. It is responsible for the subdivision and fragmentation of land holdings. Hence, productivity per hectare is very low.

- **Land Degradation**

Nearly half of the land of the country could be categorised as degraded. It is near about 43% of total land. This is a major factor of low agricultural productivity in many regions of the country.

- **Land Tenure System**

At the time of independence there has been Zamindari system. It was highly exploitative in character. So farmers were unhappy. It was the most important reason of low productivity.

- **Lack of Credit and Marketing Facility**

There is no availability of sufficient loan on fare rate of interest and lack of marketing facility. Farmers are not ready to invest in agriculture. This is the main reason of low productivity.

- **Outmoded Agricultural Techniques**

Farmers continue to use oldmoded agricultural techniques. Wooden ploughs and bullocks are still used. Limited use of high yielding varieties of seeds causes low productivity of land.

- **Inadequate Irrigation Facilities.**

Even now 52% of the gross cropped area is dependant on rains. Rainfall is often insufficient and irregular. Even some areas having irrigation facilities but not wholly utilized because of defective management.

If we remove obstacles, which affects on the agricultural development, then there will be agri-development on massive scale.

### Measures

- Farmers should change their old mind and accept new methods and technological changes.
- By accepting the co-operative farming, farmer can increase the agricultural production and stop the division of land.
- For abolition of intermediaries, Government passed law in legislations in post-independence period. After that zamindari system dispelled.
- There should be loan facility and marketing facility available when there is need.
- Farmer should use new techniques of cultivating and high yielding varieties of seeds. As well as water facilities should be available at proper period.

### Epilogue

Agriculture makes the highest contribution to GDP of India. It is almost 14.6 percent of the country GDP. Last few years, that input of the agriculture sector has declined but now it is the biggest contributor. Agriculture sector plays an important role in making Indian policy, not only because of its contribution to GDP but also because of the large portion of Indian population depends on this sector for their livelihood. It is clear that agriculture sector of India has made huge strides in developing its potential. The green revolution massively increased the production of food grains and introduced to accept the technological innovations into agriculture. This progress is proved net trade position of India. Since 1990 India became the exporter of agri-food products. This sector provides employment to the people. It is also a source of national income, source of international trade and source of livelihood. In this context it clear that "agriculture is backbone of Indian economy". In this situation government should motivate farmers for accepting new technological changes by educating and training them to adopt foreign technology. In this work it is necessary to involve NGOs to train farmers and make them ready to face the challenge of liberalization.

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## Study Of Diversity Index Of Terrestrial Orchids From South Western Maharashtra

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### Abstract

Orchids are found to occur in all parts of the world except, perhaps in the Antarctica and are most numerous in the humid tropics and subtropics (Chen, et al. 2009). South Western part of Maharashtra lies in the Sahyadris with high level of biological diversity and is recognized as one of the hotspots in the world along with Sri Lanka (Meyers, et al. 2000). The germination of orchid seeds in nature is very low due to their requirement of a specific mycorrhizal association. In the present study terrestrial orchid species belonging to the genera viz. *Habenaria*, *Nervelia*, *Malaxis*, *Peristylus*, *Pectilis*, *Geodorum*, *Zeuxine*, *Cheirostylus* and *Eulophia* are collected and recorded from the study area. In the present paper diversity index of orchids has been studied by using Shannon Weaver method.

**Keywords:** Diversity, Shannon-Weaver Index, terrestrial orchids.

### Introduction

Orchidaceae represents a peak in the evolution of monocots and is one of the most successful families of flowering plants, as is clear from the wide distribution and its innumerable species spread all over the world. Approximately 25000-35000 species belonging to 600-800 genera are recorded under this family (Arditti, 1979). Hence, diversity of terrestrial orchids was studied by using Shannon-Weaver method. Shannon-Weaver is "Diversity index logarithm to the base 2." (Carlo, H.R. et al., 1998). Diversity index is obtaining quantitative estimate of biological variability that can be used to compare biological entities, composed of discrete components in space or in time. If our data consists of random samples of species abundant from a large community or sub-community of interest, then we may appropriately use the Shannon diversity index (Shannon, 1948).

### Material and Methods

Field visits were organized to various localities in the study area for collection and study of distribution of terrestrial orchids. Field visits mostly were restricted to rainy season from June to September (up to October). Location data of every terrestrial orchid were obtained during field visit using Global Positioning System and map of terrestrial orchid location was prepared. Then diversity index of each genera of terrestrial orchid species were calculated by the following formula;

$H'$  = the Shannon-Weaver Diversity Index,

$p_i$  = the relative abundance of each group of organisms

$e^{H'}$ , OR  $H' = -\sum (N_i/N) \times \ln (N_i/N)$

Observations were classified as follows;

Class	Very Low	Low	Medium	High	Very High
H Index	0.5-1.5	1.5-2.5	2.5-3.5	3.5-4.5	4.5-5.5

### Results

1. Chaokul, Gaganbawada Katyayani, Panhala, Pratapgad, Raigad, Vaibhavwadi, Karanj, Gavse and Radhanagari show very low diversity indices from 0.5-1.5.
2. Localities such as Kolhapur, Vichitragad, Bhatwadi, Satara, Tillari, Amboli, Bhimashankar, Thoseghar show diversity index between 1.5-2.5.
3. Medium diversity indices show values within the range of 2.5-3.5 found in Pal, Patgaon, Anuskura, Barki, Mahabaleshwar, Lonavala, Ugwai, Matheran, Bamnoli and Malshej.
4. High diversity indices i.e. 3.5-4.5 were found in Kas and Chaloba Devrai.
5. Diversity index 4.5-5.5 is found in Kasar Kandgaon, Ajara and Amba. These places show very high humidity and thick forest, hence, very high diversity indices.

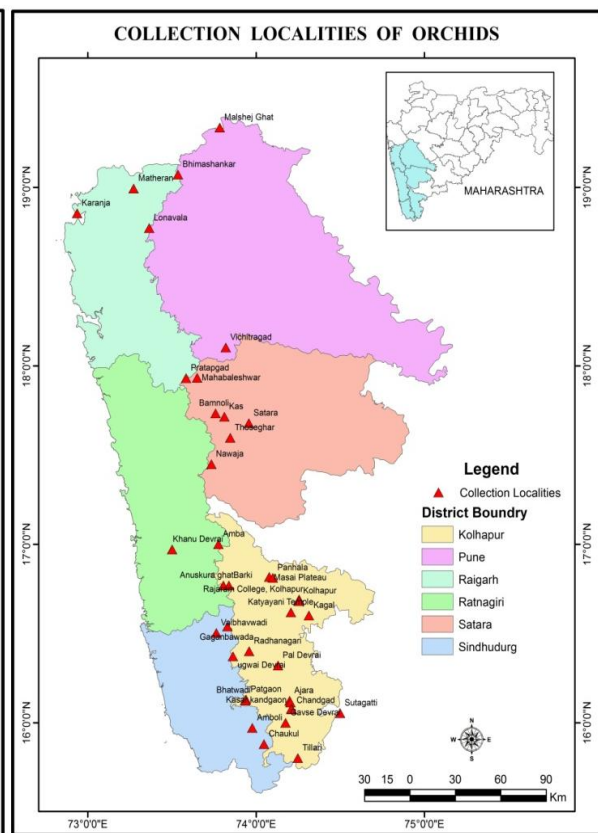
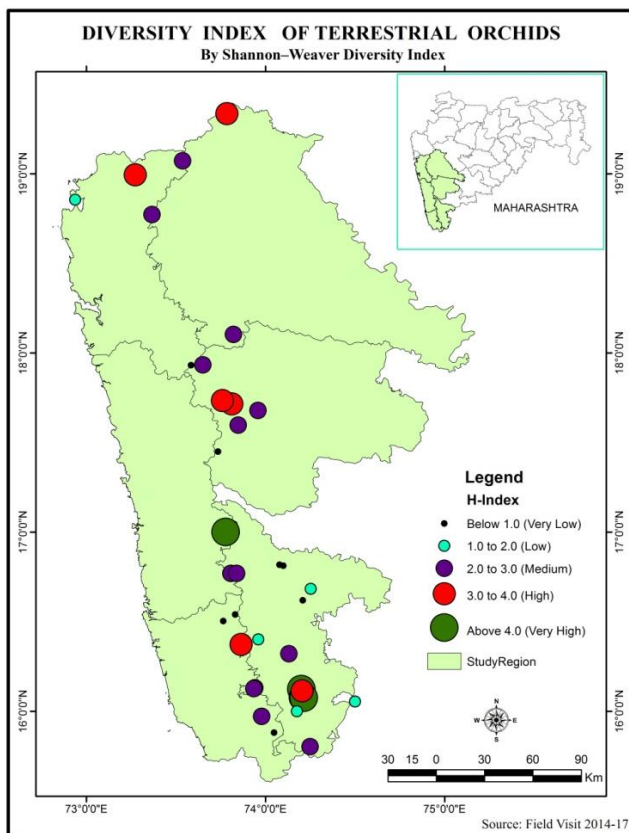
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**Table No.1: Collected orchid species with their diversity index**

Sr. No	Locality	Genera	Species	H index	Sr. No	Locality	Genus	Species	H index						
1	Ajara	<i>Habenaria</i>	10	5.12 5	19	Lonavala	<i>Habenaria</i>	6	2.97 1						
		<i>Eulophia</i>	1				<i>Peristylus</i>	2							
		<i>Geodorum</i>	1				<i>Nervilia</i>	1							
		<i>Nervelia</i>	3				<i>Malaxis</i>	1							
		<i>Liparis</i>	1		20	Mahabaleshwer	<i>Habenaria</i>	2	2.82 8						
		<i>Malaxis</i>	1				<i>Nervilia</i>	1							
		<i>Pecteilis</i>	1				<i>Malaxis</i>	1							
		<i>Peristylus.</i>	3				21	Malshej ghat		<i>Habenaria</i>	5	3.21 0			
<i>Malaxis</i>	1	<i>Malaxis</i>	1												
<i>Nervelia</i>	1	<i>Nervilia</i>	3												
<i>Liparis</i>	1	<i>Peristylus</i>	1												
2	Amba	<i>Habenaria</i>	7	5.29 1	22	Matheran	<i>Habenaria</i>	6	3.06 7						
		<i>Eulophia</i>	1				<i>Malaxis</i>	1							
		<i>Cheirostylis</i>	1				<i>Nervilia</i>	1							
		<i>Malaxis</i>	1				<i>Peristylus</i>	3							
		<i>Geodorum</i>	1		23	Masai pathar	<i>Habenaria</i>	1	1						
		<i>Nervelia</i>	1				24	Newasa		<i>Habenaria</i>	1				
		<i>Liparis</i>	1							<i>Nervilia</i>	1				
		<i>Malaxis</i>	1							25	Panhala	<i>Habenaria</i>	1		
<i>Pecteilis</i>	1	26	Pal	<i>Eulophia</i>	1	2.67 8									
<i>Peristylus.</i>	1			<i>Peristylus</i>	3										
<i>Malaxis</i>	1			<i>Nervilia</i>	2										
<i>Geodorum</i>	1			27	Patgoan		<i>Geodorum</i>	1	2.73 1						
<i>Nervelia</i>	1	<i>Habenaria</i>	7												
<i>Liparis</i>	1	<i>Peristylus</i>	3												
<i>Malaxis</i>	1	<i>Nervelia</i>	3												
3	Amboli	<i>Habenaria</i>	4	2.38 1	28	Pratapgad	<i>Liparis</i>	1	1						
		<i>Pecteilis</i>	1				<i>Peristylus</i>	1							
		<i>Nervelia</i>	1				29	Radhanagari		<i>Geodorum</i>	1	1.5			
<i>Habenaria</i>	4	<i>Nervilia</i>	4												
<i>Malaxis</i>	1	<i>Peristylus</i>	1												
4	Anuskura	<i>Habenaria</i>	4	2.82 8	30	Raigad	<i>Pecteilis</i>	4	1						
		<i>Malaxis</i>	1				<i>Eulophia</i>	1							
		<i>Nervelia</i>	1				<i>Malaxis</i>	1							
5	Bamnoli	<i>Habenaria</i>	9	3.08 8	31	Satara	<i>Habenaria</i>	10	2.23 8						
		<i>Malaxis</i>	1				<i>Pecteilis</i>	1							
		<i>Pecteilis</i>	1				<i>Peristylus</i>	1							
		<i>Peristylus</i>	1				<i>Nervelia</i>	1							
		<i>Nervelia</i>	2				<i>Malaxis</i>	1							
6	Barki	<i>Habenaria</i>	2	2.82 8	32	Thosegar	<i>Habenaria</i>	9	2.57						
		<i>Malaxis</i>	1				<i>Nervelia</i>	2							
		<i>Nervelia</i>	1				<i>Pecteilis</i>	1							
7	Bhatwadi	<i>Eulophia</i>	1	2.11 0	33	Tillari	<i>Peristylus</i>	1	2.30 1						
		<i>Peristylus</i>	2				<i>Geodorum</i>	1							
		<i>Nervelia</i>	1				<i>Eulophia</i>	1							
		<i>Geodorum</i>	1				<i>Peristylus</i>	3							
		<i>Pecteilis</i>	1				12	Gaganbawada		<i>Habenaria</i>	2	1			
		<i>Habenaria</i>	6							11	Choukul		<i>Habenaria</i>	4	0.50 0
		<i>Malaxis</i>	1										<i>Nervelia</i>	1	
<i>Habenaria</i>	5	8	Bhimashankar	<i>Peristylus</i>	1										
<i>Nervelia</i>	3			<i>Peristylus</i>	1										
<i>Peristylus</i>	1			<i>Peristylus</i>	1										
8	Bhimashankar	<i>Habenaria</i>	5	2.55 2	9	Chaloba Devrai	<i>Geodorum</i>	1	4						
		<i>Nervelia</i>	3				<i>Nervelia</i>	1							
		<i>Peristylus</i>	1				<i>Habenaria</i>	1							
		<i>Peristylus</i>	1				<i>Pecteilis</i>	1							
		<i>Nervelia</i>	1				10	Chandgad		<i>Cheirostylis</i>	1	4.17 5			
<i>Peristylus</i>	1	<i>Eulophia</i>	1												
<i>Malaxis</i>	1	<i>Geodorum</i>	1												
<i>Habenaria</i>	3	<i>Habenaria</i>	3												
<i>Peristylus</i>	1	<i>Peristylus</i>	1												

13	Gavase	<i>Geodorum</i>	1	1.42			<i>Pecteilis</i>	1		
		<i>Habenaria</i>	5				4	<i>Cheirostyli</i>		1
		<i>Peristylus</i>	2				<i>Habenaria</i>	6		
		<i>Nervelia</i>	3				<i>Nervelia</i>	3		
		<i>Pecteilis</i>	1							
14	Kas	<i>Eulophia</i>	1	3.86			<i>Geodorum</i>	1	3.04	
		<i>Habenaria</i>	8				4	<i>Peristylus</i>		2
		<i>Peristylus</i>	1					<i>Habenaria</i>		4
		<i>Malaxis</i>	1					<i>Liparis</i>		1
		<i>Pecteilis</i>	1					<i>Nervelia</i>		2
		<i>Nervelia</i>	2					<i>Pecteilis</i>		1
15	Kasar-kandgoan	<i>Habenaria</i>	4	5.11			<i>Peristylus</i>	3		
		<i>Malaxis</i>	1				7	<i>Malaxis</i>		1
		<i>Zeuxine</i>	1					<i>Nervelia</i>		1
		<i>Habenaria</i>	3							
		<i>Nervelia</i>	2							
16	Karanja	<i>Habenaria</i>	2	1.18			<i>Habenaria</i>	2	1	
		<i>Nervelia</i>	1				9			
17	Kolhapur	<i>Habenaria</i>	3	1.75			<i>Habenaria</i>	5	2.05	
		<i>Nervelia</i>	1				4	<i>Nervelia</i>		3
18	Katyayani	<i>Habenaria</i>	1	1			<i>Peristylus</i>	1	5	



## Geographical Study Of Ragi Crop Concentration In Kolhapur District

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### Abstract:

*Agriculture can contribute significantly to overall development as it provides increased food surplus to the growing population. In India, agriculture is primary activity and more than 70 per cent people engaged in this activity. India has experienced the utilization pattern of natural resources. The land use pattern in India varies from region to region. The land use and cropping pattern is affected by the physiographic and climatic conditions of the region. The study of crop concentration is an important aspect of agricultural geography as it provides a good basis for agricultural regionalization. The crops are generally grown in combinations and its rare that a particular crop occupies a position of total isolation from other crops in a given area at a given time. The physical factors determine the shape of the areas of crops, while the socio-economic relationship determines their extent. This present study discusses about the Ragi crop concentration in Kolhapur district of Maharashtra. For that location quotient method is used. This study is very important from the point of view of the planning and development of the area, in respect of growing the Ragi crop.*

**Key words:** crop concentration, location quotient, Ragi crop.

### Introduction:

Ragi crop is known as finger millet. It is grown as a cereal in Asia and Africa. It is an important staple food and fodder crop in many parts of South Asia. Ragi is the staple diet in many villages across south India. It is mainly grown in Karnataka, Tamilnadu and Maharashtra. In this paper an attempt has been made to understand the Ragi crop concentration in Kolhapur district of Maharashtra. The climatic conditions as well as soil types are also favorable for Ragi crop cultivation in Kolhapur district.

The concentration of crop in area is depending upon its terrain, temperature, moisture and padological conditions. Each crop has maximum, minimum and optimum temperature. It has tendency to have high concentration in the areas of ideal agro-climatic conditions and density declines as the geographical conditions become less conducive. The location quotient method has been applied by many geographers for determination of regional character of cropping patterns. In this method the regional character of crop distribution is investigated and determined the crop density in the region.

### Study Region:

The Kolhapur district is part of Deccan plateau and western Maharashtra. The absolute location of the district is 15<sup>o</sup> 43' to 17<sup>o</sup> 17' North latitude and 73<sup>o</sup> 40' to 74<sup>o</sup> 42' East longitude. The total geographical area of the district is 7685 sq. km. For the administration purpose the district is divided into 12 tahsils. According to the 2011 census the total population of the district is 3874015. Near about the 70 per cent of total population lives in rural area.

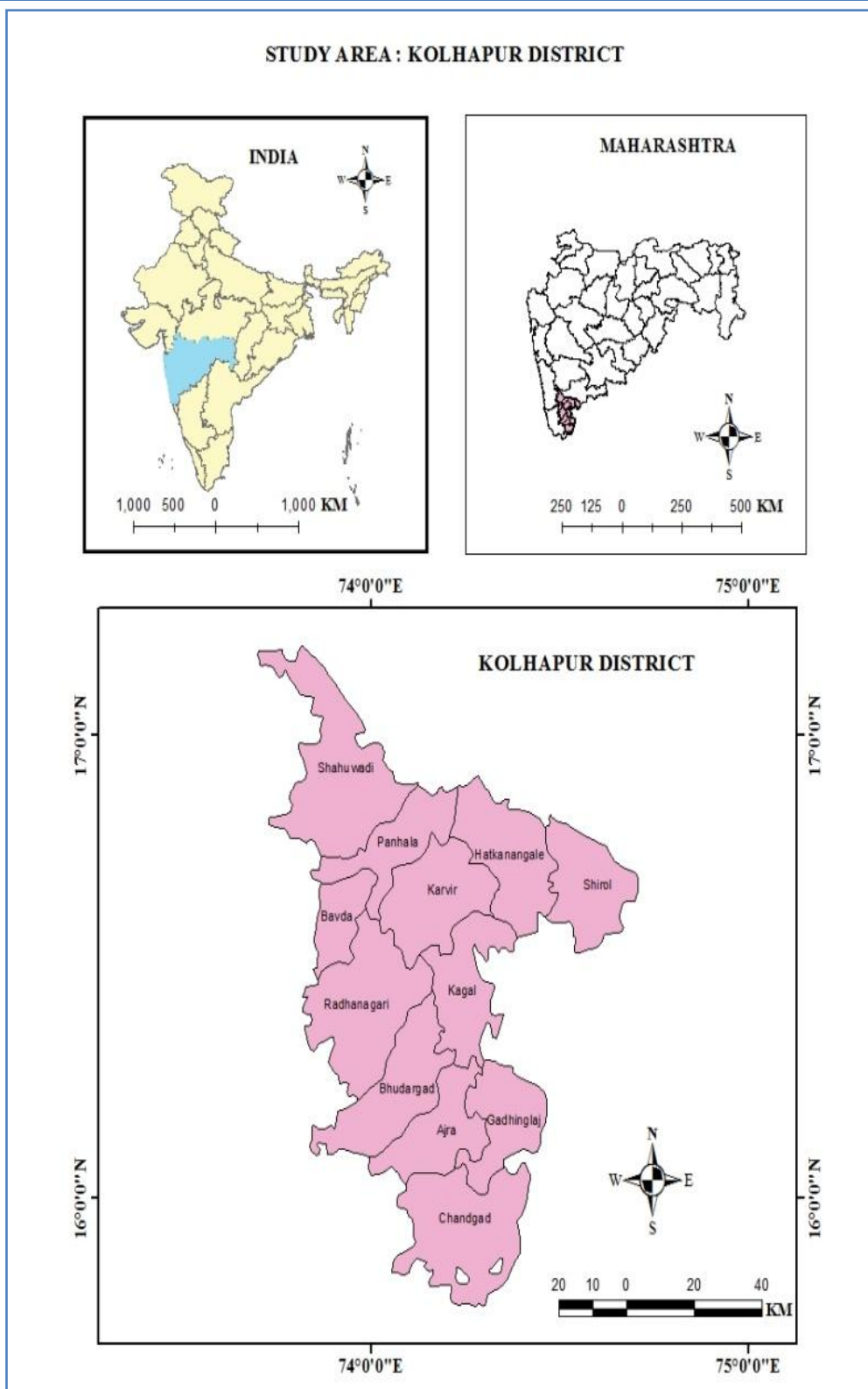


Figure: 1.0

### Objective:

The present study aims to attempt the following specific objectives:

1. To identify the land use pattern in Kolhapur district.
2. To study the nutritional status of Ragi crop.
3. To identify the geographical factors in the Ragi cultivation.
4. To assess the Ragi crop concentration of the district.



**Data Base and Methodology:**

The present research paper is based on both primary and secondary sources of the data. The primary data was collected through field work and secondary data was collected through the published and unpublished materials such as journals, magazines, books, different websites etc. The collected information is finally tabulated and interpreted with the help of statistical and cartographic techniques. Especially, the location quotient method is used to determine the concentration of Ragi crop in the Kolhapur district. For that following formula is used.

$$\text{Concentration Index of Ragi crop} = \frac{\text{Area of Ragi crop in a tahsil}}{\text{Area of all crops in a tahsil}} \div \frac{\text{Area of Ragi crop in entire district}}{\text{Area of all crops in entire district}}$$

**Result & Discussion:**

**General Land use Pattern in Kolhapur District (2013-14):**

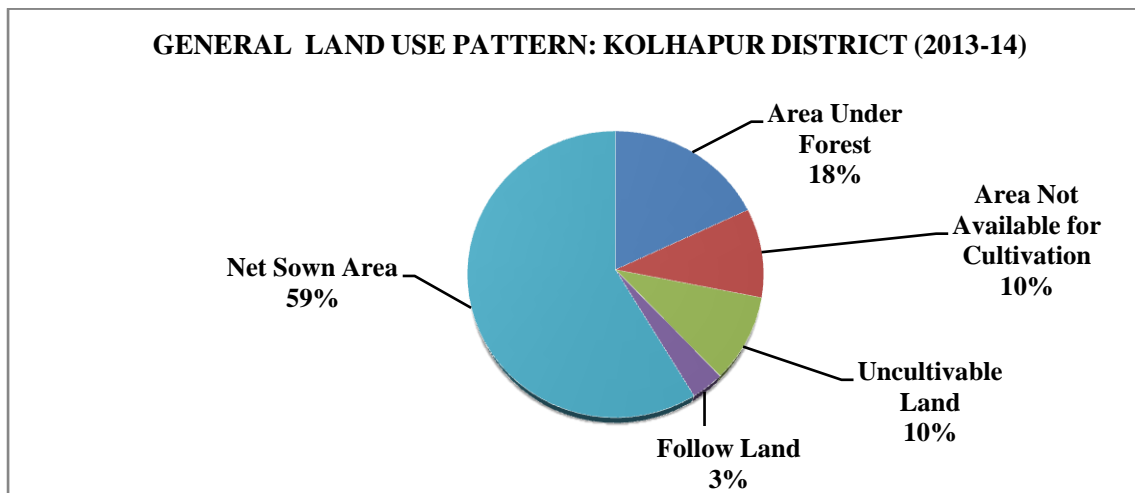


Figure: 1.1

Considering the land use pattern of the Kolhapur district 3 % of the land is follow, 18% is under forest, 10% is available for cultivation, 10% is uncultivable and about 59 % is net sown area.(figure 1.1).

**Ragi Crop:**

Ragi is an important food crop next to rice. It is the common name of finger millet in southern part of India. It is predominately grown as a dry land crop in the states of Karnataka, Tamilnadu and Maharashtra. Ragi is rich in calcium and protein and also has good amount of iron and other minerals. It is the staple diet in many villagers across south India. It is also used as major substitute for rice among the diabetic patients and also the diet conscious people. It is rich in protein and minerals in comparison to all other cereals and millets. Nutritional value of Ragi per 100g is as follows:

### Nutritional value of Ragi:

Content	Carbohydrate	Protein	Fiber	Fat	Calcium	Iron
<b>Amount per 100g</b>	72.6 gm	7.7gm	3.6 gm	1.3gm	350 mg	3.9 mg

Major portion of Ragi flour is carbohydrate which is 72.6 gm then share of protein is 7.7gm, fiber content is 3.6 gm and fat is very less which is 1.3 gm per 100 gm of Ragi. In mineral content amount of calcium is very high which is 350 mg then iron content is 3.9 mg. Including Ragi in our daily diet benefits us in many ways. Ragi is loaded with calcium which benefits us for healthy bones and teeth. Ragi also helps in controlling Diabetes because of its fiber content. Some people say that “The rice eater is weightless like a bird, the one who eats Jowar is strong like a wolf, and one who eats Ragi remains healthy throughout his life”. The Ragi is malted and its grain is ground to form flour. There are various recipes of Ragi flour, including dosa, idli, ladu, roti, papad, biscuits, ambul.and more than 70 recipes.

### Geographical Conditions:

Ragi is a crop of tropical and subtropical climate and can be grown successfully from sea level to an altitude of 2100 m on hill slopes as well as in plains. The crop matures in about 120 to 135 days depending on the tract and the variety. The 25 to 32<sup>o</sup>C temperature is required for growth of ragi crop. Sunlight is essential for development and growth of the plant. The 700 to 1200 mm rainfall is required. It grows well on red, black, sandy, loamy and shallow black soils.

### Ragi Crop Concentration Index in Kolhapur District:

Sr. No.	Tahsil	Location Quotient Index	Sr. No.	Tahsil	Location Quotient Index
1	Shahuwadi	1.12	7	Radhanagari	2.11
2	Panhala	1.00	8	Kagal	0.15
3	Hatkanangle	0.00	9	Bhudargad	2.16
4	Shirol	0.00	10	Ajara	2.50
5	Karvir	0.28	11	Gadhinglaj	0.18
6	Gaganbavada	0.83	12	Chandgad	2.61

Source: Compiled by author

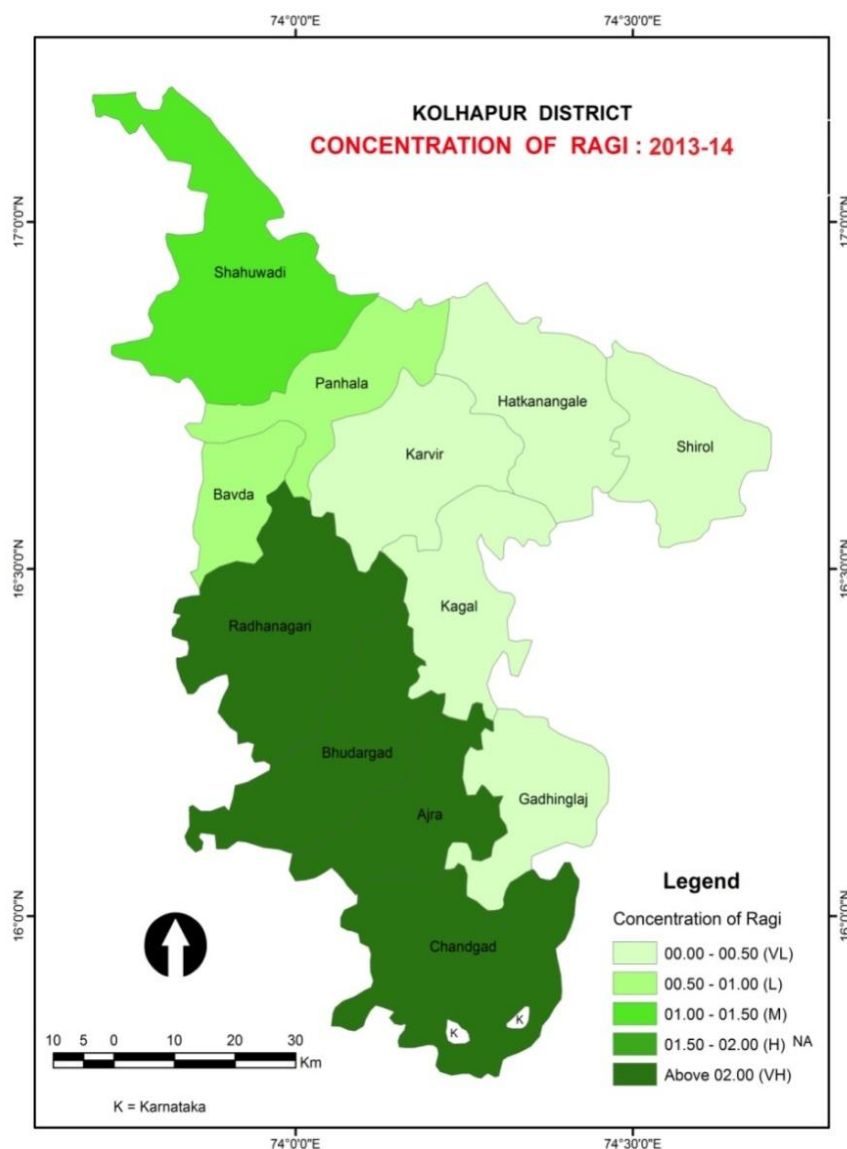


Figure: 1.2

Ragi crop concentration index is calculated by the Location Quotient method. Fig. 1.2 shows that Ragi crop concentration is very high in western part of the district that includes Chandgad, Ajara, Bhudargad, and Radhanagari tahsils. The western part of the district is mountainous region which is most favorable for Ragi cultivation. And eastern part of the district found very low in Ragi crop concentration.

### Conclusion:

The total geographical area of the Kolhapur district is 776261 hectare and the general land use pattern varies from tahsil to tahsil. The highest proportion of area found under net sown area is 455085 ha. Out of this 23784 ha is found under the Ragi crop in the year 2013-14. Ragi is important food crop next to rice. It is very rich in calcium, iron and other micro nutrients. The concentration of Ragi crop in the Kolhapur district is affected by the topography, climate and type of soil. Therefore, the highest concentration of Ragi crop is found in the Chandgad, Ajara, Bhudargad and Radhanagari tahsils mainly south western part of Kolhapur district. Medium concentration is found in Shahuwadi tahsil, and the low and very low concentration of Ragi crop is observed in the, Panhala, Gaganbavada and Gadhinglaj, Hatkanangle, Shirol, Karvir and Kagal tahsils during period under study. This type of study is useful for agricultural planning & development of the district.

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## Agro Tourism

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### Abstract:

*Agro Tourism, also known as Agri Tourism, is any activity based on agricultural operation that attracts tourist on the farm. Agri tourism includes a wide variety of activities, including buying produce direct from a farm stand, navigating a corn maze, slopping hogs, picking fruit, feeding animals or staying at a bed and breakfast on a farm. Today Agri Tourism is a fast developing business in many parts of the world including India, Australia, Canada, and Philippines. It has become an important source of supplementary income to the farmers. Even tourist are fascinated by the concept where they get a chance to be in the midst of nature and help their kids to get familiar with the agricultural operations. This paper is an attempt to understand the concept of Agro Tourism and to understand various challenges and benefits to the farmers in carrying out Agro Tourism business. The paper also suggests what facilities must be made available to tourists and what factors are important in this business.*

**Keywords:** *Agro Tourism, sustainable development, Agripreneurship*

### Introduction:

Today India has attained an impressive growth in industrial and service sector, still agriculture remains the main occupation of the people in the economy. Even today agricultural sector contributes 14 per cent to the GDP and 13 per cent to the export. Infact in India agriculture is a predominant occupation where around 70 per cent of the population directly or indirectly depend upon agriculture for their livelihood. It is worthwhile to mention that 110 million farmers are dwelling in 6.25 lakh villages producing more than 200 million tonnes of food grains, feeding the whole country. But Indian agriculture is facing number of problems these days. These problems include change in climate, drought, and flood, high or low rainfall, melting of glaciers, unsustainable agricultural lands. All these vagaries of nature leads to losses and sometimes losses are so extreme that farmers are even forced to commit suicide. Besides these, new generation are not interested in taking up agriculture as an occupation. Today, the small land holders are realising the urgent need to diversify their farm products so that additional income may be generated. Farmers are now taking up Agro Tourism as a means to supplement their farm income.

Agri-tourism is defined as travel, which combines, agriculture and rural setting with product of agriculture operation all within a tourism experience. Experience itself is the Agri tourism product, besides Tourists can buy fresh Agri produce and products directly from farmers without any middle man (agents).

### Objectives:

The following are the objectives of the paper:

1. To understand the concept of Agro Tourism
2. To understand why Agro Tourism is getting importance and what are the important factors of Agro Tourism
3. To understand the benefits and challenges of Agro Tourism
4. To understand what facilities can be offered to attract the tourists

### Methodology:

The paper is based on data collected from secondary sources such as newspapers, journals, books and internet.

### Why Agro Tourism is Gaining Importance?

Now a days the population in urban areas is increasing. Also people from rural areas are migrating towards cities in search of job and livelihood. The children of urban population have their world restricted to closed environment of school, home, coaching classes, video games, television and internet. They rarely get a chance to enjoy the beauty of mother nature. As per the research of Agri Tourism Development Corporation conducted in 2004, it was found that 43% of urban population did not have any relative left in the village. 97% of urban population wants to experience the rustic beauty of village life. This gives an opportunity to develop tourism centre in the village based on agriculture activities and other side Farmers in village are engaged in farming activity throughout the year. As it



is known, income of the farmer is mainly dependent on monsoon. Also, after selling the produce income is earned only once or twice a year. Hence, there was a need to find some alternate source of income for sustainable development. Agro Tourism helps in generating income to the farmer throughout the year.

### **Important Factors for Agri Tourism:**

There are various important factors which contribute to the success of Agri Tourism.

#### **1. Farmer:**

Farmer is an important factor in this business. Farmers belong to rural areas and really innocent. Guests are treated whole heartedly by them and do not expect any commercial benefit out of that. This attitude of farmers attracts the people from urban areas. Farmers take all the efforts to entertain their guests and are happy to that. He is friendly and not at all exploitative in nature which itself is an important factor for him to do well in the business.

#### **2. Village:**

Village i.e., the location plays an important role in this business. Village is located in the outskirts of the city, which though do not have modern facilities but is blessed with natural resources. People from urban areas enjoy the beauty of nature such as water bodies, fields, forest, mountains, deserts and islands.

#### **3. Agriculture:**

Agriculture depends on the resources such as land, water and fertility of the soil which is different from place to place and creates diversity and generated curiosity in the minds of tourists. Each place has unique characteristics which attracts tourists. The methods of cultivation, knowledge of farmers, types of plants grown are the major source of attraction. Combination of farmer, village and agriculture create a wonderful situation which provides unlimited satisfaction to the tourists especially from urban areas.

### **Agri Tourism Promotional Concepts at Farm Level:**

#### **1. Seasonal Events:**

**Autumn is a popular season for agro Tourism. This is the time when crops are fully grown and are ready for harvesting. People enjoy** vegetable harvest, fruits picking, pumpkin picking, corn mazes and hay rides. Tourists from cities come along with their families. Kids from urban areas are amazed to see the standing crops in the field as they rarely get to see all this beauty in city areas.

#### **2. Village Fairs and Festivals:**

**At many places farmers celebrate their seasonal harvest festival. This is yet another source of attraction for tourists. They enjoy the dual benefit of getting closer to mother nature and getting themselves entertained by participating in the harvest festivals such as Pongal, Onam and Baisakhi.** During these festival occasions the tourists can participate and enjoy the traditional dance and music performed by the villagers.

#### **3. Farmers Markets/You-Pick:**

If a farmer is able to manage to grow a variety of crops on his farm, he can arrange for 'Pick yourself' facility for the tourists. Tourists find it interesting to harvest fresh vegetables by themselves and then buy them and take them home. This can help the farmers to sell the harvest on the farm itself which can help the cost of transport and harvest and can be a great source of attraction for tourists.

#### **4. Vacation Stays:**

Farmers can also arrange the facility for stay. For the tourists who want to enjoy their weekends with the beauty of nature, this can be a better option. Bed and breakfast can be arranged for the guests.

#### **5. Animal Rides:**

Holiday on farms can be made even more entertaining for the guests by making an arrangement of animal ride. Ride on horses, camels, even bullock carts are the major source of attraction for kids.

#### **6. Rural Arts and Crafts:**

Villages are expert in making the handicrafts; it is something which is passed on from their one generation to the other. The tourists can carry some of the items back to the home as the memento.

### **Benefits of Agro Tourism:**

The following are the benefits experienced from Agro Tourism:

1. It helps the farmers to generate additional income other than their regular farm income which will result in their sustainable and feasible development
2. Farmers at the end of the day have a satisfaction of sharing their lifestyle with people dwelling in cities
3. They get an opportunity to interact with people which helps to build up public relation and widens their social network
4. Agro Tourism has been instrumental in generating employment opportunity for the rural people
5. It is a source of additional income to the farmers
6. One of the most rewarding aspects of Agri-tourism for many farmers is the opportunity to provide the public with a better understanding of what agriculture is really about.
7. It is also an opportunity to enhance the community's economic potential.

### **Who can start agro-tourism centres?**

Farmers who have atleast two hectares of land and other facilities such as water resources, man power, farm house and above all willingness to entertain the guests can start their Agro Tourism centres. Not only individual farmers but also Co-operative societies, NGOs, Agricultural Universities and Agri Colleges can start Agro Tourism centre which help them to give practical education to their students and serve as an additional source of income.

### **Facilities provided by agro-tourism:**

1. Offer authentic rural Indian authentic food for breakfast, lunch and dinner.
2. Farmers offer to see and participate in the agricultural activities.
3. Offer an opportunity to participate in the rural games to the tourists.
4. Provide them information about the culture, dress, arts, crafts, festivals, rural traditions and also give possible demonstration of some arts.
5. Offer bullock cart for riding and horse riding, buffalo ride in the water, fishing facility in ponds or nearest lake.
6. Offer fruits, corns, groundnuts, sugarcane other agro-products as per availability.
7. Show local birds, animals and waterfalls etc. and give authentic information about them.
8. Must provide safety to tourists' with the support of alliance hospitals.
9. Arrange folk dance programme, folk songs, Bhajan, Kirtana, Lezim dance, Dhangarigaja, etc.
10. To make available some agro-products for purchase to the tourists.
11. Offer pollution free environment to the tourists.
12. Try to create interest about the village culture for the future tourism business.

### **Major challenges and problems**

1. Lack of perfect knowledge about the agro-tourism
2. Weak communication skill and lack of commercial approach of the small farmers
3. Lack of capital to develop basic infrastructure for the agro-tourism
4. Ignorance of the farmers regarding to the such type of activities
5. Presence of unorganized sector in the Agri-Tourism industry.
6. Ensuring hygiene and basic requirements considering urban visitors
7. Lakhs of farmers have small size holding, low quality land and little or no access to credit or irrigation. Have to negotiate with consistent drought.
8. Farmers' doubt over the drop in their production on converting to organic farming. They fear drop in income as a result of converting to organic farming.
9. Farmers' livelihood is not planned based on the regions strength: its natural resources.
10. Lack of entrepreneurial skills among the farmers.
11. Lack of financial support.

### **Conclusion:**

Agri-tourism is a growing niche sector which offers tourists an authentic experience embedded in local food and culture and combines "rural aesthetics" with agricultural production into a dynamic tourist package. It gives the travellers the opportunity to experience the environmental, cultural and agricultural activities, creating income for farmers. Agri-tourism offers an additional

economic advantage for hundreds of thousands agricultural enterprises while diversifying their production activities. The paper has highlighted the benefits, challenges and scope of Agri-tourism industry. Agri-tourism has helped the farmers to become **Agriprenuer** that will help him in feasible and sustainable development.

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## Socio-Economic Constraints Of Rural Handball Players

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### Abstract :

*Rural sports are games developed in the traditional times. Practiced since ages it can be seen taking place among people involved in rural areas. The games were involved in their daily lives, some them were based on daily hunting techniques such as running, throwing, jumping. Nowadays, most of the rural sport seems extinct. Thus the development of sports in India has become a necessity. Socio-economic conditions are mainly affecting on participation of women players in India especially in rural areas. Participation of women handball players in rural areas of Kolhapur district is also affected due to some socio-economic constraints. Social customs, cultural restrictions, lack of support from schools, inadequate financial support etc. are some of the reasons. Handball is a game of strength, stamina and speed. Rural women handball players are always better in those physical fitness factors. Every year women handball teams from rural areas used to participate more at district school level tournaments than the teams from urban area. But the participation of women handball players in rural area decreases as increase in their age. Socio-economic conditions of players produce obstacles in fulfilling their fundamental right. The present study is to put light on Challenges before rural women handball Players. Mainly socio-economic problems of women handball players in rural areas of Kolhapur district.*

**Key words:** Play, Women players, Rural area, Socio-economic condition.

### Introduction :

The government of India started several sports schemes. It was to make it sure that the growth of rural sports continues to grow. Depending on the need, Rural Sports Program was launched in the year 1970-71. The main motive was to find hidden talent in rural areas. Other sports-based programs include Rajiv Gandhi Khel Abhiyan, Urban Infrastructure Scheme, Himalayan region sports festival, National Sports Talent contest. These schemes were defined under the National Sports Policy in the year 2001.

It is very unfortunate that 'Play' is denied to the children of developing countries because of the factors like wrongly directed educational policies, poverty, social customs, less importance to play than academics, attitude of teachers, parents and school administrators, urbanization etc. and India is no exception to it. Right to play, right to education & right to social security are the articles of Universal Human Rights declarations. The plight of women across the world is one of the major human rights issues, which need to be propagated so that women across the world can enjoy their freedom and liberty which every human being entitle to. In India Sports is always second preference for parents. The participation of women in Indian sports is very less as compared to developed countries. Women in rural area are not encouraged to participate actively in sports. Socio-economic factors in India mainly affecting on participation of rural women in sports activities. Participation of women in rural areas in sports is a topic virtually ignored and undeveloped. Thus factors affecting the participation can be studied.

Now days, the participation of women players from rural areas is not good enough as compare to urban areas. In Kolhapur district most of the women Handball teams participate at school level belongs to rural areas. It is seen that as per upper age group or increase in age, participation of women handball teams and players from rural area decreases. Women player in rural areas are allowed to play up to the certain age limit by their parents. Parent of these players may afraid of transgression of our culture and social restrictions and customs. The main earning source in rural area is farming and the parents of these handball players can't afford to spend money on sports equipment and facilities. The less respect from the society, insufficient financial support, inadequate sporting facilities, role of schools, less grants and scholarships from government and less contribution of district sports office etc. are some of the problems experiences by women handball players from rural areas of Kolhapur district. Women handball players from rural areas have great potential to represent at higher level. But due to some socio-economic problems, these players are not finding proper track to make their career in sports. Socio-economic problems play a role of obstacle in fulfilling fundamental right of women. This study is mainly to put light on socio-economic constraints and genuine problems of players. To fulfill 'Right to play' of women players present study concludes with the contribution and the role of family, society, schools and government.

**Importance of sports in rural area:**

Today, India lags behind many Asian countries in international sports. 20 percent of our population involves rural youth. These people are deprived of major sports facilities so there is a need of sports facility in the form of playgrounds, infrastructure for these people. Also they are affected by socio-economic problems. So it's very important to give proper attentions towards these issues to solve problems of rural female players.

**Objectives :**

1. To study the socio-economic challenges of women handball players from rural areas of Kolhapur district.
2. To study the impact of socio-economic challenges on participation of rural women players.

**Database and Methodology :**

Present study mostly relies on primary data. Primary data has been collected through sample survey. 60 women Handball players from rural areas of Kolhapur district were randomly selected. All the randomly selected players had been participated at district school level handball tournament for the academic year 2015 to 2018. Data collected by providing mixed type of questionnaire to all the players. All the randomly selected women handball players were belonging to under-14, under-17 and under-19 age groups from different high schools and junior colleges. To study social and economic conditions of women players, opinion related to their family, society and school/Jr.college were taken into consideration.

• **Table No.1 - Social challenges of women handball players.**

Sr.No.	Social Problems	No. of Players out of 60	Percentage
1	Family	51	85 %
2	Society	44	73 %
3	School/Jr.college	34	57 %

Source: Primary data

Table no.1 reveals the social challenges of women players related to family, society and school/Jr.college.

85% players think they have Family Problems. Parents expect help from players in housekeeping and want to make career in academics than sports.

73% players think they experience problems from society. They think women players have to listen to taunts and comments from society as they go outside for playing sports tournaments. Players never feel secure or free because they always think about transgression of our culture and social restrictions when they wear sports kit, go outside for playing.

57% players feel they don't get proper help from their schools/Jr.college. Sometimes players don't get proper help from teachers and classmates regarding their missing studies due to various tournaments. As a meritorious sports person, these players' experiences less respect from teachers and classmates as compared to toppers students in studies.

• **Table No.2 - Economic challenges of women handball players**

Sr.No.	Social Problems	No. of Players out of 60	Percentage
1	Family	54	90 %
2	Society	42	70 %
3	School/Jr.college	47	78 %

Source: Primary data

Table no.2 reveals the economic challenges of women players related to family, society and school/Jr.college.

90% players think they have serious economic problems in their family. Players restricted by their parents to spend more money to get sports material and sports related facilities. Main reason is income source of parents is farming and animal husbandry. Various expenses of women players are not affordable to parents when they participate at higher level i.e. at National or International Level.



70% women players don't get proper and enough financial help and support from society that is from relatives, villagers, political leaders, social activists, NGOs etc.

78% players feel their school/Jr.college doesn't support them if players suffer economic problems. Players don't get T.A., D.A. for every tournament. For students it is not easy and possible to purchase sports materials individually. Players don't get adequate sports material and facilities or scholarships from schools.

• **Table No.3 - Reason may decrease participation of women handball players**

Sr.No.	Reason	No. of Players	Percentage
1	Social	23	38 %
2	Economic	37	62 %
	<b>Total</b>	60	100 %

Source: Primary data

It is found that the main reason which may decrease participation of women handball players is economic reason. 62% players think they may not participate in handball in future due to economic reason. While 38% players think they may not participate due to social reasons. It is important to highlight that the percentage of players who gives economical reason is significant.

• **Table No. 4 - Participation of Teams for the academic year 2015 to 2018.**

Sr.No.	Year	Kolhapur District Level Tournament		
		Under - 14	Under - 17	Under - 19
1	2015-16	08	06	03
2	2016-17	13	10	04
3	2017-18	11	8	02

From Table no.4 it is clear that the participation of women handball teams at under-14 age group is more than under-17 age group for all the three academic years. Similarly participation of teams at under-17 age group is more than under-19 age group. One handball team contains 16 players. Decrease in one team means decrease of all 12 players. From the table it is clear that as age and age group of women handball player increases, participation of these players decreases significantly.

**Conclusion:**

Women handball players in rural areas of Kolhapur district have some serious socio-economic challenges. Their Problems start from family. Career in academics than sports is the main expectation of their parents. Due to genuine economic family problems, players can't participate freely in sports. Society restricts players to improve their natural and growing talent by giving importance to social customs. Overall development of a child is always a main responsibility of Schools/Jr.colleges. But lacuna in educational sports policies is demoralizing rural women handball players. This lacuna is due to lack of Government grants & funds to school for sports. These socio-economic conditions may affect directly on overall developmental process of rural women players. All these problems directly make effect on the participation of rural women handball players in sports. We can say socio-economic problems of rural women handball players are the main obstacle for participate more in different level tournaments.

**Suggestions:**

Attitude of parents must change. Sports awareness of parents should be increase. Sports should be compulsory part of curriculum at school level. Provide effective and modern coaching can find natural talent in student. Players must get enough time for physical training, adequate sports material, financial help, proper respect and motivation.

Society should respect the values and ethics of sports. Financial support from NGOs, social activists, political leaders etc. can boost enough confidence of players. Felicitation of meritorious player at social events/programs

Government should provide adequate sports materials to women players. Well-equipped sports centers, grounds to attract women for more participate. Sports scholarships to women players,

different grants to schools, funds to private sports academies can solve financial problems of women handball players.

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## Problems of Shirdi Religious Tourist Centre

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### Abstract:

*Tourism is vast growing industry of world. In tourism religious tourism is becoming point of attraction in recent days. But many religious tourist centers are facing worst condition in regards of accommodation, food transportation and related all facilities. Shirdi of Sai Baba is also one of the richest religious centers of Maharashtra but still there are certain drawbacks in development of tourism. Therefore this paper aims to study problems in religious centers. For this purpose response of 100 devotees has been recorded through questionnaires. Several problems like pollution, traffic, crime and cheating were raised by tourism. In this present study an attempt has been made to identify problems of religious tourism.*

**Key Words:** *Tourism, Religion, Palkhi, SSST, Devotees, Foreign Exchange*

### Introduction:

The Tourism is a chief and fast growing industry in the world. This industry has vast potential for earning foreign exchange, tax revenue and employment opportunities in backward region. Today in India religious tourism become more popular. Maharashtra is known as *Santanchi Bhumi* (land of sages). Several Sages like Sant Dnyaneshwara, Sant Tukaram, Sant Ramdas, Sant Namdeva, Sant Eknath etc. have enlightened society with spiritual knowledge in medieval period. Sant Gadagebaba, Rastrasant Tukadoji Maharaj, Sant Gajanan Maharaj, Swami Samarth, Saibaba are the sages of modern age, who taught humanism to society. So these places become religious centers and these religious centers are becoming point of attraction for pilgrimage tourism.

Basically pilgrimages are oldest tradition of any religion. Many people visits, Temples, Samdhi, Durgah, Gurudwara, Tombs, Churches. Many devotees visit these places at the time of festivals, fairs and death and birth anniversaries. Recently Shirdi is emerged as national religious place. Several devotees and Palkhis are coming Shirdi throughout year from Gujrat, Andhra Pradesh, Karnataka, Tamilnadu, Madhya Pradesh, Chhattisgarh. Even devotees from different countries are visiting the Shirdi therefore it is become place of international importance. In this paper this tourist place has been studied from the view of geographical perspective. To get information about problems regarding tourist, several techniques like interviews questionnaires and secondary data sources has been used.

### Objectives:

The main objective of this present study is to study the problems of religious tourist center of Shirdi. On the basis of this it is further aimed to suggest meaningful suggestions for the development of tourism in the study area.

### Study Area:

Shirdi houses the shrine and tomb of an early 20<sup>th</sup> century guru named Sai Baba who lived here from c.1880s-1918. In less than a century the place has evolved into one of the most popular pilgrimage centers: the NCAER report ranked it as the 2nd most visited place in the country with more than eight million visitors annually. Located in the Ahmednagar district of Maharashtra, Shirdi is close to three major urban centers, namely, Mumbai (about 300 km), Pune (about 180 km), and Nashik (about 100 km). At its beginning (in the 1910s) Shirdi had about 200 houses and a population of around a thousand residents. In 2011, its native resident population was about 35,000 and the town spread over a geographical area of about 13 Sq.km. Shirdi's growth, on one hand is due to the popularity and followership of Sai Baba; a large proportion of Sai Baba's devotees are from urban centers and often seek his divine intervention in their mundane problems and hence a trip to Shirdi. The appeal of Sai Baba seems to be universal as he lived the life of a mendicant (fakir); was removed from any religious affiliations and is believed to continue to perform miracles for his devotees and therefore a guru who can 'be revered along with other household deities'. Simultaneously, the town's growth is attributed to the ways the shrine and religious tourism surrounding it is managed by the Shri Sai Sansthan Trust (SSST), a public charitable trust supported by the state. The trust was formed immediately after Sai Baba's death to manage the endowments and monetary income that was donated in his name. Its structure and functioning, however, has evolved over last few decades. SSST

efforts in providing infrastructure and services for the visitors contributed to the massive influx of visitors.

Shirdi is famous religious center in Ahmednagar district. It is located in Rahata tehsil. It is on Nagar Manmad highway and well connected with Nasik, Aurangabad and Ahmednagar by road, railway and air. It is also connected from Sainagar railway station by railway recently. Devotees can arrive on nearby railway stations like Andarsul Manamad, Kopargaon, Belapur and Puntamba. Now recently it is connected by air rout. Kakadi airport is 4 km away from Shirdi. Permanant Helipad Service is also available in Shirdi.

#### STUDY AREA: LOCATION



#### Methodology and Data Collection:

In order to study the above objectives primary and secondary data is used this study is based upon fieldwork, observations and personal interviews by devotees, local peoples and shopkeepers etc. Questionnaires are main source of data. Secondary data was collected from Gazetteer of Ahmednagar district. District census handbook, District socio-economic abstract, Report of Shri. Sai Baba Sanstshan Trust Shirdi. All the collected data is finally classified, tabulated and presented in the form of table, graph and map etc.

#### Problem Faced by Tourist:

Tourism is become most attractive industry over the world. Due to revolution in transport spread of education and culture, rising standard of living increased up to certain extent. Large scale industrial development has increased pollution and congestion, traffic problems and these all led people to search for peace of mind, beauty of nature and spiritual satisfaction

Shirdi is holy place of Sai baba and it is .famous for Samadhi of Saibaba. On the occasion of Ramnavami, Gurupornima and Vijayadashmi more than 4 lakh devotees visit Shirdi. On Sunday and Thursday more than 50,000 devotees visits Shirdi per day. On gurupoornima and some occasions more than 100 palakhis processions along with on an average 150 devotees towards Shirdi. Such huge number of devotees leads to considerable strain on existing facilities in town, which has given rise to many problems related to social, economic and environmental.

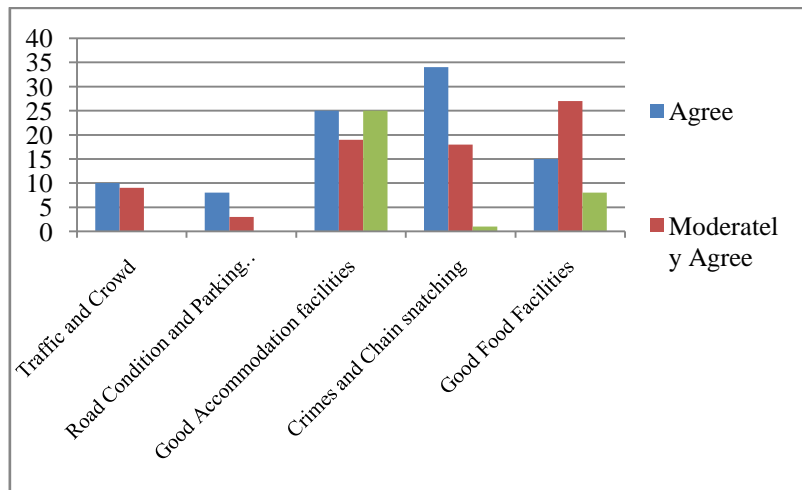
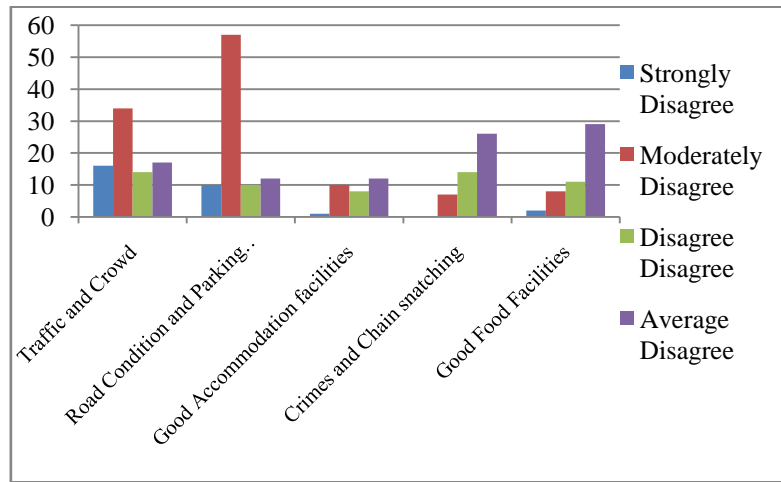
**Table No.1: Response of Devotees**

Sr. No.	Problem	Response of Devotees						
		Strongly Disagree	Moderately Disagree	Disagree	Average	Agree	Moderately Agree	Strongly Agree
1	Traffic and Crowd	16	34	14	17	10	09	00
2	Road Condition and Parking problems	10	57	10	12	08	03	00
3	Pollution / Garbage (Land, Water and Air)	00	15	32	19	20	14	00
4	Good Accommodation facilities	01	10	8	12	25	19	25

5	Crimes and Chain snatching	00	07	14	26	34	18	01
6	Good Food Facilities	02	08	11	29	15	27	08

Source: Field Work 2016

**Figure No. 1 Response of Devotees**



### 1. Traffic And Crowd:

At the time of major festivals more than 4 lakh devotees gathered in Shirdi. The narrow roads and make congestion and traffic. Many devotees park their vehicles on gate or highway, many travel vehicles stop on road for passengers and many Hotel agents, Parking boys, peddlers and flower cellars occupy road space which makes overcrowding in Temple premises. Sometime this congestion leads to an accident which cause for loss of life and huge traffic jam.

### 2. Road Condition And Parking Problems:

Road condition of Shirdi is very pity. Very large potholes has been created on highway, therefore devotees did not travel with ease. The extension work of Nagar Manmad highway has not completed .This highway is experiencing big potholes from Kopargaon to Kolhar. Due to shortage of place parking problem is becoming crucial in Shirdi. There are certain pay and park facilities are available near temple but they are insufficient. So people have to park their vehicles hospital, school and other open spaces which lead to another problem like robbery.

### 3. Pollution and Garbage:

Water pollution and garbage has been observed in Shirdi up to high level. Lendi nala is one small stream passing through Shirdi. But it is covered by plastic, papers bags, jars bottles. This creates bad smell in premises. Due to vehicles enormous dust and smoke floating near roadside. Many Palakhi comes to Shirdi while coming in Shirdi they use to big D.J., Loud speakers and C.D.players etc. which create noise pollution.



**4. Accommodation Facilities:**

Recently Sai Baba Santhan has build 500 rooms, 200 rooms and Sai dwarawati Lodging facilities for Sai devotees. Again one big project of 2000 rooms has been competed therefore accommodation facility is easily available for people. Many private lodging and hotels also provide good accommodation. Sai Palkhi Niwara is also big accommodation facility for devotees near Shirdi.

**5. Criminal Activities:**

Because of crowd many crimes happen in Shirdi. Pick pocketing near bus stop, railway station and Spoil in shops is become routine. As famous pilgrimage centre many beggars attract towards Shirdi. Many Sai Devotees from Sothern states of India were cheated and robbed; type of chain snatching is also increasing day by day.

**6. Food Facility:**

Many devotees have given good response for food facility. All type of food South Indian, North Indian, Gujrathi thali, Punjabi thali is available in Shirdi. For economically weak devotees Sai Prasadalya provided food in cheap rate. Saibaba Sansthan has provided tea, coffee, Nasta pakit (breakfast) and meal in cheaper rate.

**Suggestions:**

Therefore it is suggested that

1. During the festival period, holidays of Diwali, Christmas and New Year road congestion should be avoided by restricting hawkers, travel vehicles. There should a substitute road for the crowdie or rush period. Flyovers or Ring road or bypass should be developing according to necessity.
2. Though Shirdi is connected with Nagar Manmad road. Quality of road is worst. Therefore Sai Baba Sanstan should make and repairs the road frequently.
3. To avoid pollution awareness should create in pilgrims and use of plastic should be banned. To clean Lendi nala participation of local people or NGOs should taken to become Clean Shirdi and Green Shirdi. D.J. and Loud speaker should be banned after entering Shirdi to avoid noise pollution.
4. Police patrolling on bus stop and railway station road should be increase in order to make secure feeling in mind of Saibaba devotee.

**Conclusion:**

Thus it is concluded that, though Shirdi is being international tourist centre. In coming days air transport will start and importance of Shirdi will glorify in the map of world. But before that satisfaction level of tourist in Shirdi is on the lowest stage, except accommodation and food all remaining facilities should grow further by qualitative means not by quantitative. The facilities should be created tourist friendly and tourist centric. To combat with problems like water shortage and traffic jam long term planning should be implemented. These all will make new beginning for religious tourism.

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## Role of Modern Technology in Agriculture Development of India

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### Abstract-

India occupies 2.4% of world land and support over 17.5% of world population. Indian farmer faced a big problem that is shrinking size of his farming plot. In 1970-71 size of farming plot is 2.28 hectares but it becomes 1.68 hectares in 2015-16. Land divided among more and more in family members over generation resulting in average holding falling dramatically. Today 99.9 million farmers marginal land holder it is less than one hectare. When first agricultural census carried in 1970-71 in that period total marginal farmers are 36.2 million. Today marginal farms average is 0.38 hectare it is 1.08 in 1970-71. One house consist five member 99.9 million farmer means 500 million individuals are depend on such marginal farming. In Bihar marginal farmers are 91.2% and in Uttar Pradesh it is 80.2%. By 2050 global population accepted to increase by 40% to 9.6 billion people in order to feed this drastically increasing population. Agriculture need to produce 70% more food while only using 5% more land.

The introduction and implementation of mechanization occur in 1900-1930 and genetic modification occurs in the world 1990-2005 are related to Ag1.0 and Ag2.0 we believe the Ag3.0 will be most transformative and disruptive not only on farm but across entire agriculture and food value chain. Over last few decades massive technological development and opportunities have transformed people's lives. However these opportunities have not benefited the agriculture sector in significant way farmer and various other actors along the agriculture value chain need significant amount of information. Information technology will play key role in knowledge exchange targeted recommendation market integration and access finance to make agriculture profitable enterprise and attractive for youth. Over the past few decades agriculture has witnessed different phases of growth first phase referred as 1.0 farming it extended from 1947-1966 and it characterized by revolutionary land reform that exploitative zamindari system. Second phase was green revolution it increased India's farm productivity manifold and eliminated our dependence on foreign food aid it termed as 2.0 farming. It is gold age of India's history of agriculture farming 3.0 are about deceptive like smart farm machinery, micro irrigation, precision farming, digital platforms and partnering stock holder. In 1960 farmer feed 26 people in a machine revolution but today farmer feed 155 people a biotech revolution by 2050 farmer will need to feed more than 265 people it possible by digital revolution. In first two revolutions major impact for farmer and selected agribusinesses but digital agriculture will fundamentally transform every part of agribusinesses value chain.

**Key Words-** Digital, Revolution, Empowering, Agribusinesses, Marginal farms, Ecosystem etc.

### Introduction-

India occupies 2.4% of world land and support over 17.5% of world population. Indian farmer faced a big problem that is shrinking size of his farming plot. In 1970-71 size of farming plot is 2.28 hectares but it becomes 1.68 hectares in 2015-16. Land divided among more and more in family members over generation resulting in average holding falling dramatically. India is world's largest sourcing destinations for information technology about 67% 130 million market accounted. In agriculture information technology helps overcome productivity stagnation strengthen market linkage and enhancing farm management. In agriculture digital application include remote sensing via satellites geographic information system. Crop and soil health monitoring and livestock and farm management. It also helps give weather advisories and disease pest related assistance at post-harvest stage real time data on both domestic and export market is provided. It also make farmer smart in discussion about farming and to benefit farm and economic use of inputs and labor. India is unique characteristics agriculture country in world it shows different zone of agro climatic. So that over 250 different crops are cultivated in India other side in developing countries of world only 25-30 crops is cultivated. In India with favorable agro climatic zones many natural resources occur. So that India is world's main recognized agricultural country. Agricultural mechanism in India influenced by technological development of England.

Now a farmer can cultivate on more than two acres of land with less labor and can cut costs even more when they are looking for a used tractor and other harvesting technology, versus new equipment. In agriculture time and production are so important you have to plant time harvest in time and deliver to stores in time. Modern agriculture technology gives small number of people to grow high amount of food and other crops in shortest period. Modern transportation technology and

facilities help farmers, easily transport fertilizer or other farm products from farm to markets. Irrigation of plants in dry areas like deserts farmers have introduced technology to irrigate their crops. In India tractor industry developed in 1945 to 1960. Tractors and bulldozers imported for land reclamation and cultivation in mid-1940 in 1947 central and state tractors organization setup to develop supply and use of tractors in agriculture. 1951 in India 8500 tractors in use 20,000 in 1955 and 37000 by 1960. Then local production of tractors started in India and in 1980, 146000 units in working in these field. These factors improve mechanization in Indian agricultural field.

Digital agriculture is Information communication technology and daily ecosystem to support the development and delivery of timely targeted information and service to make farming profitable and sustainable. Better faster and cheaper delivery through digital technology is goal of Information communication technology. Digital farming describes the evolution in agriculture and agricultural engineering from precision farming to connect knowledge from production system. Aim of digital farming is to use all available information and expertise to enable the automation of sustainable process in agriculture. In early 2010 precision boosted by advancement of new technologies such as cheap and improved sensor, actuators and microprocessors high bandwidth cellular communication cloud based ICT systems and big analytics.

Digital India scheme or policy launched by India's prime minister Narendra Modi on 15<sup>th</sup> July 2015 for create digital infrastructure for empowering India's rural communities. Also for enabling digital delivery of service and promoting digital literacy. In India 68% population is rural and agriculture is main source of their live hood for 58 % population. So that consider role of digital agriculture within digital India. Digital agriculture can be defined as information and communication technology and data ecosystem to support the development and delivery to timely, targeted information and service to make farming profitable and sustainable (society, ecosystem and environment). Delivering safe nutrient and affordable food for all rural community will be key to marketing cost data and accesses to information. It would empower rural youth to relies their potential forever to increase their probability by accessing equitable markets and rural business to other value added service. Digital agriculture is spatial data infrastructure and low cost smart phones and liability to support the bidirectional flow of data and information to rural consumers. Modern farming occupied by US, Australia, Europe, China, Israel and Brazil. Another factor is mobile in India about 960 million used in witch 204 million having smart mobile user today. Its GPS track is used in agriculture. Digital agriculture will also help to achieve the objective of nutritional food security. It is most efficient, effective and equitable manner to ensure all have access safe nutritious and affordable food.

### **Objectives-**

- To analyses the impact of modernization on agriculture
- To study future impact of modern technologies on agriculture
- To focus the importance of modernization of agriculture for farmers empowerment
- To study the modern technologies in agricultural process

### **Hypothesis-**

- Indian farmer having problem that is shrinking size of his farming plot
- Increasing population is challenge for agriculture production
- Indian farmer having lack of knowledge of modern technologies

### **Analysis-**

India occupies 2.4% of world land and support over 17.5% of world population. Indian farmer faced a big problem that is shrinking size of his farming plot. In 1970-71 size of farming plot is 2.28 hectors but it becomes 1.68 hectors in 2015-16. Land divided among more and more in family members over generation resulting in average holding falling dramatically. Today 99.9 million farmers marginal land holder it is less than one hector. When first agricultural census carried in 1970-71 in that period total marginal farmers are 36.2 million. Today marginal farms average is 0.38 hector it is 1.08 in 1970-71. One house consist five member 99.9 million farmer means 500 million individuals are depend on such marginal farming. In Bihar marginal farmers are 91.2% and in Utter Pradesh it is 80.2%. In India all data about land used is as follows.

**Table No.1-Land Used In India**  
 (Figure in million hectares)

Sr. No	Classification	1950-1951	1990-1991	2000-2001	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
01	Geographical area	328.73	328.73	328.73	328.73	328.73	328.73	328.73	328.73
02	Area for land(2+9)	284.32	304.86	305.19	307.41	307.48	307.39	307.49	307.80
03	Forest	40.48	67.81	69.84	71.56	71.59	71.60	71.57	71.83
04	Non cultivated(A+B)	47.52	40.48	41.23	43.33	43.58	43.53	43.58	43.86
05	A-Nonagricultural use	09.36	21.09	23.75	26.16	26.40	26.31	26.50	26.91
05	B-Barren& uncultivable	38.16	19.39	17.48	17.18	17.18	17.22	17.07	16.95
06	Other uncultivated land	49.45	30.22	27.74	26.50	26.15	26.11	26.08	25.83
07	Pasture & grazing lands	06.68	11.40	10.66	10.34	10.31	10.31	10.26	10.26
08	Under miscellaneous tree crops & groves	19.83	03.82	03.44	03.21	03.20	03.16	03.18	03.19
09	Cultivable west land	22.94	15.00	13.63	12.95	12.65	12.64	12.64	13.39
10	Fallow lands (C+D)	28.12	23.37	25.04	26.85	24.60	25.18	26.32	24.85
11	C-Fallow lands	17.45	09.66	10.27	10.84	10.32	10.67	11.04	10.69
12	D-Current fallow	10.68	13.70	14.78	16.01	14.28	14.51	15.29	14.15
13	Net area sown(E+F)	118.75	143.00	141.34	139.17	141.56	140.98	139.94	141.43
14	E- Total cropped area	131.89	185.74	185.34	188.99	197.56	195.69	194.14	200.86
15	F-Area more than once	13.15	42.74	44.00	49.82	56.00	54.71	54.20	59.43
16	Cropping intensity	111.07	129.89	131.13	135.80	139.56	138.81	138.74	142.02
17	Net irrigated area	20.85	48.02	55.20	61.94	63.66	65.70	66.27	68.10
18	Gross irrigated area	22.56	63.20	76.19	85.08	88.89	91.78	92.25	95.77

(Source- DEC& FW)

By 2050 global population accepted to increase by 40% to 9.6 billion people in order to feed this drastically increasing population. Agriculture need to produce 70% more food while only using 5% more land. When the increasing challenges and feeding over growing population agriculture has been continuously re-inventing itself more. So in the last decade the farming community has deal with decaling drabble land area. Prolific pest and disease as well as atmosphere and sometime weather pattern introduced by climatic change these issues are juxtaposed by agriculture industrialization. In India also population growth increase day by day in 1900 population India was 27.13 cored after independence in 1950 it become 35.04 cored it increase as follows.

**Table No.2-Population of India-**

Sr. No.	Year	Population	Yearly % of change	Yearly change	Density (P/Km <sup>2</sup> )	Urban Population
01	1955	409,269,055	1.69%	6,588,771	138	71,906,548
02	1960	449,480,608	1.89%	8,042,311	151	80,586,315
03	1965	497,702,365	2.06%	9,644,351	167	93,540,800
04	1970	553,578,513	2.15%	11,175,230	186	109,709,315
05	1975	621,301,720	2.34%	13,544,641	209	132,732,329
06	1980	696,783,517	2.32%	15,096,359	234	161,445,950
07	1985	781,666,671	2.33%	16,976,631	263	190,338,784
08	1990	870,133,480	2.17%	17,693,362	293	221,979,229
09	1995	960,482,795	2.00%	18,069,863	323	254,314,016
10	2000	1,053,050,912	1.86%	18,513,623	354	288,365,219
11	2005	1,144,118,674	1.67%	18,213,552	385	329,516,783
12	2010	1,230,980,691	1.47%	17,372,403	414	372,901,884
13	2015	1,309,053,980	1.24%	15,614,638	440	419,938,867
14	2016	1,324,171,354	1.15%	15,117,374	445	429,802,441
15	2017	1,339,180,127	1.13%	15,008,773	450	439,801,466
16	2018	1,354,051,854	1.11%	14,871,727	455	449,945,237

In these available land production crops is as like follows



**Table No.3-All India Crop wise yield-  
 (Figure in Quintal/ hectares)**

Sr. No	Crops	1950-1951	1990-1991	2000-2001	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
01	Rice	06.68	17.40	19.01	22.39	23.93	24.16	24.16	23.91	24.04
02	Jowar	03.53	08.14	07.64	09.49	09.57	08.50	09.57	08.85	07.81
03	Bajara	02.88	06.58	06.88	10.79	11.71	11.98	11.84	12.54	11.55
04	Maize	05.47	15.18	18.22	25.40	24.78	25.66	26.76	26.30	25.10
05	Wheat	06.63	22.81	27.08	29.88	31.77	31.77	31.45	27.50	30.93
06	Coarse cereal	04.08	09.00	10.27	15.31	15.90	16.17	17.17	17.03	15.95
07	Gram	04.82	07.12	07.44	08.95	09.28	10.36	09.60	08.88	08.59
08	Arhar	07.88	06.73	06.18	06.55	06.62	07.76	08.13	07.30	06.56
09	Total pulses	04.41	05.78	05.44	06.91	06.99	07.89	07.64	07.28	06.52
10	Total food grains	05.52	13.80	16.26	19.30	20.78	21.29	21.20	20.28	20.56
11	Sugarcane	334.22	653.95	685.78	700.91	703.17	682.54	705.22	715.12	710.95
12	Groundnut	07.75	09.04	09.77	14.11	13.05	09.95	17.64	15.52	14.86
13	Rapeseed & Mustard	03.68	09.04	09.36	11.85	11.45	12.62	11.85	10.83	11.84
14	Soybean	04.26	10.15	08.23	13.27	12.07	13.53	10.12	09.51	07.37
15	Sunflower	06.53	05.35	06.05	07.01	06.92	06.55	07.50	07.36	06.97
16	Total oilseed	04.81	07.71	08.10	11.93	11.35	11.68	11.68	10.75	09.68
17	Cotton	00.88	02.25	01.90	04.99	04.91	04.86	05.10	04.62	04.32
18	Tobacco	07.31	13.53	13.18	16.87	16.13	15.42	16.12	18.42	-

(Source- DEC& FW)

Over last few decades massive technological development and opportunities have transformed people's lives. However these opportunities have not benefited the agriculture sector in significant way farmer and various other actors along the agriculture value chain need significant amount of information. Information technology will pay key role in knowledge exchange targeted recommendation market integration and access finance to make agriculture profitable enterprise and attractive for youth.

In India tractor industry developed in 1945 to 1960. Tractors and bulldozers imported for land reclamation and cultivation in mid-1940 in 1947 central and state tractors organization setup to develop supply and use of tractors in agriculture. 1951 in India 8500 tractors in use 20,000 in 1955 and 37000 by 1960. Then local production of tractors started in India and in 1980, 146000 units in working in these field. These factors improve mechanization in Indian agricultural field.

**Table No.4-Top leading companies of tractors in India -**

Sr no	Company	Collaboration	Year
01	Eicher Tractors Ltd.	Geber Eicher Tractor w. Germany	1961
02	Gujarat Tractors Ltd	MotokovPrah. Czechoslovakia	1963
03	TAFE	Messey Ferguson UK	1961
04	Escorts Ltd	Moloimportarazawazakladymechaniczneursus Poland	1964
05	Mahandria and Mahandria	International harvester UK	1965
06	+ Escorts Tractor Ltd	Ford UK	1971
07	Hindustan Machine Tools	MotokovPrah. Czechoslovakia	1971
08	Kirloskar Tractors Ltd	Klohner Humboldt Deutz Germany	1974
09	Punjab Tractors Ltd	CMERI India	1974
10	Pittie Tractors Ltd	Own know how	1974
11	Harsha Tractors Ltd	Moto Import Russia	1975
12	Auto Tractor Ltd	British Leyland Uk	1981
13	Pratap Still Rolling Mill	Own know how	1983
14	Vst Tillers	Mitsubishi Japan	1983
15	United Auto Tractor Ltd	UzinaTractorul. Romania	1986
16	Bajaj Tempo Ltd	Own know how	1987
17	Asian Tractor Ltd	Own know how	1989
18	International Tractors	Own know how	1998
19	Larsen and Turbo Ltd	John Deere USA	1999
20	New Holland Tractor	New Holland Italy	1999
21	Greaves Ltd	Same DeutzFahr Italy	1999

Green revolution refers to series of research, development and technology transfer initiatives occurring between 1940 and the late 1970 that increased agriculture production the world initiative green revolution lead by Norman Borlaug so he is also known as father of green revolution. Number of varieties / hybrid seed developed and released for cultivation in India (before 2004).

All cereals- 1254, pulses- 466, Oil seeds- 400, food crops- 92, fiber crops- 216, other crops- 20 total- 2442

Top 10 seed companies in India- by Global Seed concentration

1. Monsanto (USA) -2803 (Million in 2004)
2. DuPont (USA)- 2600
3. Syngenta(SWD)- 1239
4. Group Lima grain (France)- 1044
5. KWs AG (Germany)- 622
6. Land O lake (USA) – 538
7. Sakanta (Japan)- 426
8. Bayer Crop Science (Germany)- 387
9. Talkie (Japan) – 366
10. DLP Trirollum (Denmark)- 320

In 1960 yielding of improved hybrid varieties of crops started in India it is irrigated crops. So that then production of irrigated pumps and diesel engine started for the cultivation and harvesting of crops different agricultural equipment's are produced. Diesel engines, electric motors, irrigation pumps, sprayer, and duster, land development machinery tractors, spare parts, power tillers like equipment's comes in market. Power tiller production started in 1961 it is strength for upland work and provided more comfortable work environment to the operator. Harvesting machine self-propelled, tractor powered combines and truck type combine harvester available for farmer. Ditcher for making ditcher for irrigation and drainage many cultivators it used for making seed bed preparation in dry and wet land soils. Rotavator used preparing seed bed in a single pass both dry and wet land condition. Tractor drawn ridged used making furrows and ridges for crops. Sugarcane cutter used cutting purposes, fogging machine, tractor sprayers used for spraying insecticides.

Krushivani is one of message based agro advisory though it former get 35 message per week it is free in regional language. These messages having 16 categories such as weather, market, crop information, government schemes, nutrition health, livestock, disease management etc. It generated by ICRISAT and delivered to various group of farmer, You tube learning improved farm management technologies short video created by farmer in local language on topic relevant to neighboring farmer are proving to the effective dissemination strategy. Today new paradigm of agricultural development is fast emerging in both developing and developed countries. Over all development of rural area is expanding in new direction old wings of delivering important service to citizens are being challenged and traditional societies being transformed into knowledge society to all over world. Information communication technology has potential application in agricultural extension. Information communication technology helps extension system with in reorienting itself towards the overall agricultural development of small production system, It also play important rule in bring about sustainable agricultural development. Information communication technology project Gayandoot (Madhya Pradesh) Warana wired village (Maharashtra) Information village (Pondicherry) automated milk collection center of Amul(Gujarat), Land record computerization (Bhoomi Karnataka), online marketing and CAD-N (Karnataka), Knowledge network for grass root inventions (Gujarat), Mahitizsamuha(Karnataka), VOICES (Karnataka), center for alternative agriculture media, haritayan.com like services are available in India. e-NAM, Pradhanmantri Kristi sinchanyogana, soil health card, 100% FDI for food processing unit, under MIDH government provide 4392 cold storage, 20710 CA stores with 19.47 million tones capacity, 411 farm packing house, 408 ripening chambers, 4414 primary processing units and 101 processing units.

Village knowledge center it is information dissemination center providing instant access to farmers to latest information knowledge available in field of agriculture starting from crop production to marketing. Village resource center are connected to knowledge center like agricultural universities, skill development institute and hospitals over 6500 programs have conducted by VRC in area of agriculture/ horticulture, fisheries, livestock, water resources, Tele health care, awareness programs, women empowerment, supplementary education. Computer literacy, Micro credit, skill development / vocational training for live hood support etc. These irrigate viva smart mobile is playing big role in

monitoring and controlling crop irrigation. With the right equipment a farmer can control his irrigation systems from a phone or computer instead of driving to each field. Moisture sensors in the ground are able to communicate information about the level of moisture present at certain depth of soil. The recent agriculture has converged with technologies like Information technology (IT), biotechnology (BT), environmental technology (ET) and Nano technology (NT). It focuses on area like production level reduction in labor burden, high quality and organic production and quality management. Second is important to meet consumers' needs at production and distribution stages through building a system, which deliver safety information. Digital information helps to farmers getting access to fund from various sources due to the exposure and awareness they get being digital. Forecasts on climate change information helps farmer in deciding the right seed to grow and in turn fulfill demand that is out in the market

### **Importance of topic-**

In this topic focus of subject is on moderation of Indian agriculture sector. It gives information of different modern equipment's which comes in use of agriculture field. It also gives knowledge of agriculture changes and its advantages and disadvantages to farmer. Today is Information technology world so that use of information technology communication increase day by day. The concept of digitalization also comes in focus in every sector it used so that agriculture also used digital technology. The topic also focused on digital process of agriculture.

### **Conclusion-**

Indian agriculture sector is very important sector according to employment and economics. Population of India is depending upon agriculture all their important necessities. Above 70 percent population of country depending upon agriculture day by day population of India increase but land under cultivation of crops not increase it is decrease so that food production problem creating for avoid these problem new modern techniques in agriculture using is necessary. The new agriculture techniques help farmers to increase their production and also faced the natural calamities. Today Indian farmer also faced different natural problems according to their regions. Some places heavy rain fall and some place no rain fall condition occur in India. For facing these problem new modern techniques in agriculture is necessary.

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## Potential Of Roof-Top Rain Water Harvesting In Balwant College Campus, Vita

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### Abstract:

*Water scarcity is serious problem throughout the world for both urban & rural community. Urbanization, industrial development & increase in agricultural field & production have resulted in overexploitation of groundwater & surface water resources and resultant deterioration in water quality. The conventional water sources namely well, river and reservoirs, etc. are inadequate to fulfill water demand due to unbalanced rainfall. While the rainwater harvesting system investigate a new water source. The aim of the present study is to evaluate of potential of roof-top rainwater harvesting. In this study, the rain water harvesting (RWH) system is an analyzed as an alternative source of water at campus of Balwant College Vita, The expected outcome of the study is the development of rainwater harvesting system for catchment area of campus from all Blocks and buildings. The result analysis shows that the present RWH system is having the storage 39, 18,000 liters/year. The established system satisfies the college requirements of water and can make above 2.33 liter water available per person per day throughout the year.*

**Keywords:** Rain water harvesting, Ground Recharge tank, Drainage system etc.

### Introduction

Lack of water is serious problem throughout the world. The urban and rural area also faced water scarcity. Increasing Population, increase in agricultural field, industrial development has caused in overuse of groundwater & surface water resources. Now a day's quality and quantity of water resource also declined. The conventional water sources namely well, river and reservoirs, etc. are insufficient to satisfy water demand due to unbalanced rainfall. While the rainwater harvesting system investigate a new water source. The concept of rainwater harvesting is necessary for reducing number of problems like soil degradation, Floods, droughts, pollution and climate change have created even more problems related to nature conservation.

### Concept of Rain Water Harvesting:

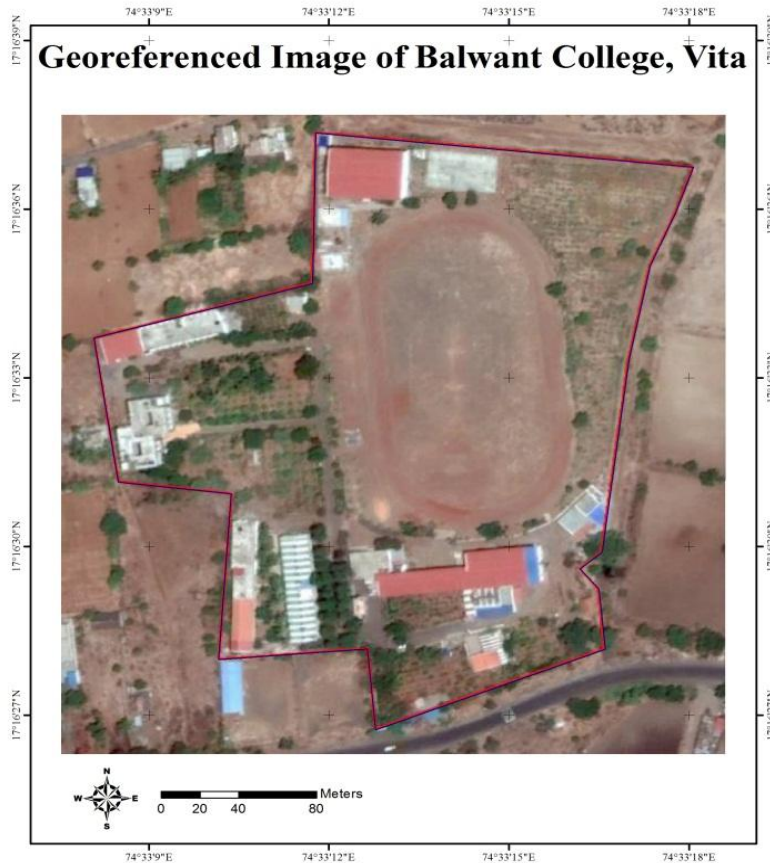
Rainwater harvesting is a technology used to collect, convey and store rain water for later use from relatively clean surfaces such as a roof, land surface or rock catchment. RWH is the technique of collecting water from roof, Filtering and storing for further uses. Rainwater Harvesting is a simple technique of catching and holding rainwater where its falls. Either, we can store it in tanks for further use or we can use it to recharge groundwater depending upon the situation. RWH system provides sources of soft, high quality water reduces dependence on well and other sources and in many contexts are cost effective. RWH system is economically cheaper in construction compared to other sources, i.e. well, canal, dam, diversion, etc. [1]

### Objective :

1. To study geographical profile of the Balwant college campus.
2. To evaluate the drinking and domestic water supply system in college campus.
3. To examine the roof area of the buildings and calculate the water to be stored or used for ground water recharge.
4. To suggest an appropriate sites to store the roofs harvested water.

### Study Area:

The campus of Balwant College, Vita is located at 17°16'29''N latitudes and 74°33'14''E longitudes and is placed in Khanapur Tehsil of Sangli district in the Western Maharashtra region. The height of Vita is 560 meter from mean sea level and average rainfall is 595 mm.



**Data Source and Methodology:** The research work is based on primary as well as secondary data. Primary data collected through field visit. Secondary data collected through office in college. The built up and building wise roof area, the number of students and total number of staff in college.

However the collection efficiency varies according to roof. So Ranade's table employed to estimate the collection efficiency.

**Table 1 Estimated Collected Efficiency**

Sr. No.	Type of Roof	Estimated Collection Efficiency (as % of precipitation)
1	Cement Concrete	85
2	Baked tiles	60
3	Tin sheets	75

Source: Ranade (2000)

For estimating the potential for roof rain water harvesting in Balwant College campus area have adopted R. N. Athavale's (2003) formula.

**Roof area \* Amount of rainfall = Volume of water harvested**  
*(Square meter) (Cubic meter)*

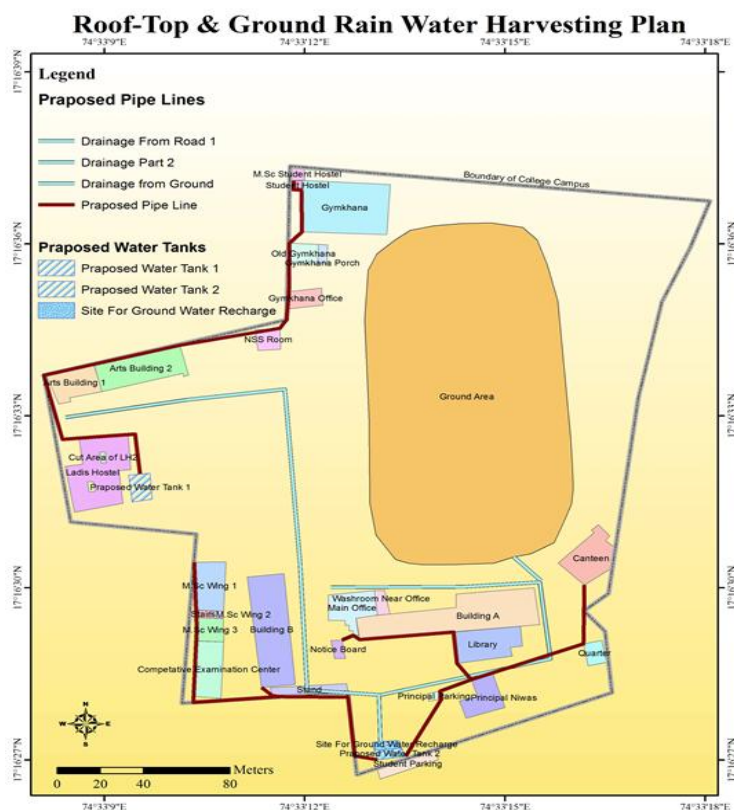
**Example:**

Rooftop Area : 325 square meter  
 Average rainfall in Vita : 595 millimeter (0.595 meter)  
 Runoff Coefficient: 0.85  
 Volume of water harvested : 164 cubic meter (164000 liters)



### Result and Discussion

In the present study an attempt has been made to calculate the actual potential of roof-top rain water harvesting of Balwant College campus. The R.N. Athavale,s formula used and following calculations are made.



**Block-wise Potentiality of Roof-top Rain Water Harvesting**

**Table No. 2**

Sr. No.	Name of Buildings	Roof Area in Square Meter (Cement Concrete)	Potential in Liters
1	Office	325	164000
2	M.Sc Chemistry Wing	520	263000
3	Ladies Hostel	842	426000
4	Arts Building	594	300000
5	Gymkhana Old	119	60000
6	Student Hostel	18	9000
<b>Total</b>		<b>2418</b>	<b>12,22,000 Liters</b>

Source: Personal Computation

**Table No.3**

Sr. No.	Name of Buildings	Roof Area in Square Meter (Tin Sheets)	Potential in Liters
7	A Building	1270	567000
8	Washroom Near Office	112	50000
9	Library	454	203000
10	Notice Board shed	48	21000
11	B building	942	420000
12	Staff Parking Stand	147	66000

13	Competitive Examination Centre	384	171000
14	Arts Building	320	143000
15	NSS Room	120	54000
16	Gymkhana Office	136	61000
17	Gymkhana Porch	42	19000
18	Gymkhana	1050	469000
19	M.sc. Student Hostel	40	18000
20	Canteen	431	192000
21	Principal Niwas	268	120000
22	Principal Parking	24	11000
23	Student Cycle Parking	167	75000
<b>Total</b>		<b>5955</b>	<b>26,60,000 Liters</b>

Source: Personal Computation

Table No. 4

Sr. No.	Name of Buildings	Roof Area in Square Meter (Baked Tiles )	Potential in Liters
24	Staff Quarter	101	36000
<b>Total</b>		<b>101</b>	<b>36000 Liters</b>

Source: Personal Computation

Table No. 5

**Total Potentiality of Roof-top Rain Water Harvesting in College Campus**

Sr.No.	Type of Roof	Area in Square meter	Potential in Liters
1	Cement Concrete	2418	12,22,000
2	Tin Sheets	5955	26,60,000
3	Baked Tiles	101	36,000
<b>Total</b>		<b>8474 Square meter</b>	<b>39,18,000 Liters</b>

Source: Personal Computation

The Balwant college campus comprises of **24** Blocks with a total roof area of **8474** sq.mt, has been selected for comprehension of roof top rainwater harvesting potential where the average rainfall is **595** millimeter (0.595meter). The average potential of roof-top rainwater harvesting in Balwant College Camus is **39, 18,000** Liters per annum.

The average number of peoples in college is **4602** which includes number of students of all branch (4252), teaching nonteaching and official staff (200) and daily visitors (50) of college. So the water stored from rooftop can used for daily uses. Per person per day water availability calculation is following:

$$\begin{aligned}
 \text{The availability of water/Annual (Average)} &= 3918000 \text{ litres} \\
 \text{Water availability per person/annually} &= 3918000 / 4602 \text{ persons} \\
 &= 851.73 \text{ litres} \\
 \text{Water availability per person per day} &= 851.73 / 365 \text{ days} \\
 &= 2.33 \text{ litres}
 \end{aligned}$$

It is scientifically proven that through rooftop rainwater harvesting method water scarcity can be minimized to certain extent and collected water can be used for different purposes in particular washing, gardening, toilets etc. and drinking purpose(after purification) in general. With this it can be inferred that Balwant College campus has huge potential to harvest rain water and can make above **2.33 liter** water available per person per day throughout the year. In this way above 90 % requirement can be met as the entire college can collect **39, 18,000 liters** of water per annum.

The water from the ground and roads can be collected through the internal drainage system and it can be used for ground water recharge.

## Findings:

- The slope of area of the college from north to south means towards the main gate.
- In present there is need to construct separate drainage system for collecting rainwater from the ground and roads in college campus.
- The water collected through the drainage used for ground water recharge in planned ground water recharge site.
- A separate pipe-lines are to be laid to collect roof-top rain water from all the roofs in college campus.
- An appropriate two under-ground storage-tanks are to be constructed-
  - 1) one for storing the rain water on Ladies hostel, Arts Building, NSS Office, Gymkhana and boy's hostel room and Collected on proposed under- ground tank in garden near the ladies hostel.
  - 2) Second one storing the rain water on Science building, M.Sc. and Competitive examination Building, main office, main building, canteen, Principal house and collected proposed under- ground tank in garden near the gate.
- With the help of roof rainwater harvesting we can make above 2.33 liter water available per person per day throughout the year.

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## A Study, Growth and Role of Dairy Industry in Rural Development in Maharashtra.

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### Abstract

*The present communication highlights the current situation, growth and role of dairy farming in Maharashtra. It is one of the developing economies where agriculture is a predominant occupation of the large number of masses. Agriculture in Maharashtra is depending on rainy season. It provides employment to nearly 50% of population in Maharashtra; the farmers are in guilty situations. The majority farmers' families are poor and debt ridden. They commit suicides as unable to cope up the adversaries of man and the nature. In such a scenario they need to have another option of earning. Dairy provide the way to come out from the adverse situations.*

*Milk production is a very important element of the whole dairy chain. Dairy co-operatives, helped to create strong network and linkages in millions of rural households scattered across the country. Currently India contributes more than 16 percentage of the world's total milk production. India's milk output is estimated to be 133 million tonnes (GOI, 2012-13). The co-operative sector in Maharashtra has emerged as one of the fifth largest in the India and is playing an important role in socioeconomic development of millions of rural families.*

*It is estimated that up to 60-65 percent of the income of this group (marginal and small-scale farmers) now comes from dairying. Studies have shown that dairying in rural areas surpassed crop production in terms of profit in marginal, small and medium-sized holdings. For small-scale farmers with irrigated land, dairying and crop production together, were more profitable than crop farming alone. Over the period, dairying has also acquired the contours of a fully-fledged industry in the country and has positively improved the life of those engaged in this business, directly or indirectly, bringing significant socio-economic changes. In the present research article efforts are made to highlight the Study, growth and role of dairy business as one of the promising allied sector of agriculture in Maharashtra.*

**Keywords:** Growth, Performance, Dairy Sector, Agriculture, Dairy, Co-operative, Rural families.

### Introduction

During last two decades, total bovine milk production in Maharashtra has doubled from 39 lakh tonnes (LMT) to 88 lakh tonnes in 2013-14 and the contribution of local cows, cross-bred cows and buffaloes was about 15 per cent, 42 per cent, 43 per cent respectively. It has increased despite the fact that the state has maximum rainfed area amongst major milk producing states. It is partly due to increase in number of in-milk animals across all categories and also due to gradual shift from local cows to crossbred cows. Region wise, western Maharashtra - particularly Pune division - accounted for about 40 per cent of the total milk production of the state followed by Nashik division which accounted for about 25 per cent. Similarly, the milk production density was highest in Pune division followed by Nashik division. The co-operative sector in Maharashtra has emerged as one of the largest in the India and is playing an important role in socio-economic development of the country.

Maharashtra has been struggling with droughts and water shortage for the last many years and this has resulted in shortage of both green and dry fodder. As a relief measure, the government supports dairying by organizing free fodder camps every year in rainfall deficit areas. It also arranges for the procurement of sugarcane tops from cane growers, its transportation and ultimate distributing it to the livestock owners in scarcity areas at subsidized rates. To cope up with fodder shortages, government is often forced to ban the sale of fodder outside the district where it is produced and prohibited cattle herders from the neighboring states from grazing their animals in Maharashtra. Region wise, dry matter availability from crop residues is considerably lower in the districts of Ahmadnagar, Pune, Kolhapur, Sangli and Satara due to higher density of dairy animals in these regions. In case of Gadchiroli, Gondia and Chandrapur, the area under forest is relatively higher reducing dry matter availability.

### Objectives of the study

- 1) To study the overall milk production in Maharashtra.
- 2) To evaluate the performance of the dairy business in Maharashtra.
- 3) To find out the problems faced by dairy business.
- 4) To make an evaluation of the "Operation Flood" and its implication.
- 5) To study growth, role of dairy production in Maharashtra.

### Sources of Data

The study is primarily based on secondary data. The data is collected from the different government reports and news collected from the various newspapers and magazines published in Maharashtra. Certain references are also taken from the different scholarly research articles published in the field.

### Milk Production in Maharashtra

For each of the product segments, the report provides a thorough analysis of the current and historical value and volume trends, market share of key players and market forecast. Currently, liquid milk represents the biggest product segment in Maharashtra, accounting for around 57% of the total market share. Some of the fastest growing segments include frozen/flavoured yoghurt, cheese, UHT milk, probiotic milk drinks and flavoured milk. The competitive landscape of Maharashtra's dairy market has also been examined in this report. Some of the major players include Amul (Gujarat Co-operative Milk Marketing Federation Ltd), Gokul (Kolhapur Zilla Sahakari Dudh Utpadak Sangh Ltd), Warana (Shree Warana Sahakari Dudh Utpadack Prakriva Sangh Ltd), Mother Dairy and Chitale Dairy.

The study provides a detailed evaluation of the dairy market landscape in Maharashtra, covering the current, historical and future trends for milk production, milk production by cattle, milk procurement prices, etc. The major milk producing districts Pune, Ahmadnagar, Solapur, Satara, Sangli and Kolhapur recorded a 90 per cent drop in milk procurement. Mumbai requires 50 to 60 lakh liters of milk per day. In the absence of milk procurement from western Maharashtra, the government is trying to make arrangements from Karnataka and Gujarat's Amul, which supplies 15 lakh liters of milk per day to Mumbai and could boost it according to the demand.

"The average milk procurement in the state is 123 lakh liters per day, which has come down to 67 lakh liters today after the strike. There is a dip of 56 per cent due to lack of supply. But Mumbai is largely unaffected so far. Nashik and Ahmadnagar districts were the most affected as 90 per cent procurement did not take place today," said CS Chaugale, Deputy Commissioner of Dairy Development. If the scarcity increases, the big milk federations will have to choose an option of reconstituting milk, which include mixing milk powder and white butter.

### Operation Flood:

Government is actively supporting the dairy sector by implementing various schemes. It all started with the White Revolution under the title Operation Flood (OF) Programme launched in 1970. By promoting Anand Pattern of dairy cooperatives, OF envisaged sustained increase in resource productivity culminating in improved quality of life of milk producers and assured supply of quality of milk and other dairy products to consumers at reasonable price in a free market environment. The cooperative path, market oriented milk production and modernization of dairying, milk production, processing and marketing progressed significantly. The bedrock of Operation Flood has been village milk producers' cooperatives, which procure milk and provide inputs and services making modern management and technology available to members.

### Hygiene and Cleanliness

All the producers are frequently kept informed on the importance of observing hygiene and cleanliness of animals and milkers at the time of milking and at the milk collection centre. It has been observed that such learning is carried with them in their daily living habits.

### Health Care

The privilege of collecting the milk from members places an obligation on the cooperatives to provide inputs to increase the milk production. Accordingly, the unions operate elaborate veterinary services at their doorstep to take care of cattle health. Exposure to various modern technologies and their applications by the veterinarians to treat their animals has made farmers more aware of healthcare for their family members as well.

### Conclusion:

The conclusion of present communication is the though Maharashtra is the most milk producer in the India, here the per animal milk production is very low. The cost of production of milk is also high due to the high cost of fodder. The quality of milk animals in Maharashtra is also not upto the mark. But if we will overcome our deficiencies, the dairy industry is one of the most promising sector in Maharashtra and it uplift the economical level and solve farmer suicial problems up to some extent.



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## Challenges Of Indian Agriculture In Contemporary Epoch

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### Introduction

Agriculture in India was regarded as the backbone of the Indian economy, but is this statement is true in present day? In the present scenario the agriculture has lost this tag due to several reasons. The rapid growth of service sector has pushed agriculture and industrial sector leaving behind. There was no concrete efforts were made by the governments to improve the state of Indian agriculture. The LPG policy adopted by the government in 1991 has become the bane for agriculture sector in the earlier years. The drought like situation arising from time to time has also contributed for the slow growth of this sector. The share of agriculture that was more than 50 percent of GDP in 1950-51 has drastically come down to 17.32 percent in the year 2016-2017<sup>1</sup>. The average annual growth rate of agriculture sector in the 12<sup>th</sup> five year plan starting from 2012 to 2017 is around 1.6 percent.<sup>2</sup> This shows that growth rate of agriculture in India's GDP has slows down in the last few years. From many years the Indian agriculture is facing various challenges such as excessive dependence on nature, continuous division and fragmentation of land holding, low productivity, farmers suicides, lack of mechanization at desired level, price instability of agri-crops, failure of crop insurance schemes, etc., a combination of these factors are leading to the episode of agrarian crises in the country living farming community under stress. Under this background this paper analyses the policy of Crop Insurance Scheme, Farmers Suicides and Loan Waiver Scheme introduced by the present governments and their effectiveness in solving these challenges.

### Objectives:

1. To assess the degree of challenges faced by the agriculture sector in the country.
2. Effectiveness of several schemes introduced by the present governments.
3. To give suggestion for changing existing challenges into potential opportunities.

### Methodology:

This paper is based on secondary information. To meet the research objective necessary data were collected from published books, journals, reports, magazines, research papers, newspapers and from websites.

### Crop Insurance Scheme (Pradhan Mantri Fasal Bima Yojana):

One of the fundamental causes for farmers' suicides in the country is the failure of crop due to vagaries of nature. To conquer this problem the crop insurance scheme is the best way forward. The Pradhan Mantri Fasal Bima Yojana which was introduced in April 2016 after merging all other earlier insurance schemes is regarded as a mile stone in reducing the severity of the problem. It is premium based scheme under which farmer has to pay 2 and 1.5 percent of sum insured for Kharif and Rabi crops respectively, and 5 percent for annual commercial and horticultural crops. The remaining part of premium amount is shared by central and state governments' equally. Whenever, insured crop fails due to the vagaries of nature and other few reasons the Insurance Company pay the claims of sum assured to the farmer. Various studies have been conducted by different agencies to assess the effectiveness of the scheme and they found some lacunas in policy itself and its effective implementation.

When we observe the data released by the Ministry of agriculture and farmers welfare, in the first year of its implementation i.e., in 2016 in Kharif season nearly 4.02 crore farmers are insured their crop by paying Rs.2, 958 crore premium and both central and state governments have paid Rs.13, 641 crore in total they have paid Rs.16, 599 crore to the Insurance Companies and claims paid by them is Rs. 10, 284 crores. It comes around 62 percent of the premium paid, giving 6,315 crore (38 percent) profit to the insurance company. Out of 4.02 crore farmers only 1.06 crore farmers got benefit from this scheme. It shows that the insurance companies are getting more benefit than the farmers.

In a RTI reply filed by P P Kapoor to the ministry of agriculture and farmers welfare revealed that during two years of 2016 and 2017 a total premium of Rs. 49,408 crore was paid to the insurance

companies and out of this Rs. 33,612 crore (68 percent) was paid by them to the farmers as claims. The difference between the compensation paid and premium received was Rs. 15,795 crore (32 percent) and this money goes to private insurance companies like Reliance General Insurance, ICICI Lombard, TATA-AIG etc. The government owned Agricultural Insurance Company (AIC) of India which was made Rs. 2,611 crore profits in 2016 was kept away in the next year to do the business<sup>3</sup>. Under the scheme only selected private corporate like Reliance, ICICI, TATA-AIG etc., have been given the task of providing crop insurance. In one of the case, some 2.80 lakh farmers sowed soya in their fields in Maharashtra. In a district the farmers paid premiums of Rs. 19.2 crore, the state and central government paid Rs. 77 crore each, amounting to a total of Rs. 173 crores which was paid to Reliance Insurance. The entire crop failed and the insurance company paid out the claims. Reliance paid Rs. 30 crores in one district, giving it a total net profit of Rs. 143 crores without investing a single rupee. Now multiply this amount to each of the district it has been entrusted said the Journalist P Sainath.<sup>4</sup>

Karnataka government is planning to dump the Pradhan Mantri Fasal Bima Yojana and come out with its own crop insurance scheme on the line of Bihar has done, due to corporate friendly instead of farmers. According to Agricultural secretary M Maheshwar Rao, 'Enrollment for Pradhan Mantri Fasal Bima Yojana in Kharif season has decreased to 13 lakh hectares in 2018 compared to 17 lakh hectares in the last year<sup>5</sup>. This shows the scheme is losing its popularity due to some inbuilt difficulties and irregularities.

After observing the various studies conducted by different agencies the Pradhan Mantri Fasal Bima Yojana has some inbuilt shortcomings under its present shape. It has very rigid terms of parameters for farmers to receive insurance and there are delays in settlement of claims. It is assumed that the scheme is going to benefit insurance companies instead of protecting the interest of farmers.

#### **Farmer's suicides and loan waiver schemes:**

Suicides by farming community are dishonorable challenge faced by the agriculture sector in India. As per National Crime Records Bureau in the year 2015, **8,007** farmers/cultivators and 4,595 agricultural labors totaling 12,602 persons committed suicides, accounting for 9.4 percent of total suicides in the country.<sup>6</sup> The farmers' suicides in the country are goes on increasing especially in 21<sup>st</sup> century due to one or the other reason. Some of the major causes for farmers suicides as noticed by experts are crop failure due to vagaries of nature, increased burden of debt, continuous harassment by private money lenders, increased cost of cultivation, family problems and responsibilities, lack of remunerative prices for their produce, health hazardous etc., are major factors responsible for farmers suicides in the country.

The NCRB data shows that 38.7 percent of farmer's suicides are reported due to Bankruptcy in 2015. Among 3,097 suicides committed by farmers/cultivators due to 'Bankruptcy or Indebtedness', 2,474 (79.8 percent) farmers/cultivator have taken loan from 'Financial Institutions like Bank/Registered Micro Financial Institutions' and 302 (20.2 percent) of them have taken loan from 'Money Lenders' during 2015<sup>7</sup>. It means the institutional sources of finance are becoming more harmful than the non-institutional sources of finance to the farmers.

Another important reason for farmers' suicides in India is failure of crop due to vagaries of nature. Even today 60 percent of cultivable land is under rain fed and rain is very uncertain, irregular, untimely and uneven resulting in failure of crop and low yield. Along with this the heavy rain, floods, droughts, cyclones, fire accidents and so on are posing the threat to farm production. During 2014-15 and 15-16 country has faced the acute drought situation especially in the state of Maharashtra, Telangana, Karnataka, Chhattisgarh, Madhya Pradesh and Andhra Pradesh leading to more farmers suicides. A total of 795 out of 1,562 suicides committed by farmers/cultivators due to 'Farming Related Issues' were reported in Maharashtra alone, accounting for 50.9% of total such suicides in the country during 2015<sup>8</sup>.

Steps taken by the government to avoid farmers suicides in India are not able to keep away the suicides. To avoid suicides the several state governments have adopted loan waivers schemes, the government of Karnataka has waived the formers loan to the tune of Rs.8,167 crore in the year 2017 and in this year (2018) the government headed by H D Kumarswamy has announced waiver of farmers loan to the tune of around 34,000 crores to waives the loan up to 2 lakh rupees of each farmer. The government of Uttar Pradesh waived off 36,000 crores, Maharashtra Rs. 35,000 crore and Punjab to the tune of Rs. 365 crore by introducing loan waiver schemes<sup>9</sup>. Farmers are pressurizing central

government too to waive off the loan. Till now the government has not taken any step in this regard. But at what extent this is going to help the farmers to avoid suicides should be come out in future.

RBI Governor Urjit Patel responding to the question on whether there were any concerns on loan waivers he said 'waivers engender moral hazards and impacts credit discipline that damages the national balance sheet'. SBI chairman Arundhati Bhattacharya had said, 'We feel that in case of a (farm) loan waiver there is always a fall in credit discipline because the people who get the waiver have expectations of future waivers as well'.<sup>10</sup>

The loan waiver schemes may provide temporary relief to farmers to come out from the stress of debt and to undertake cultivation activities in the next season. But many experts argue that the loan waiving scheme is not going to benefit the farmer in long term.

### **Suggestive Measures:**

The crop insurance scheme when it is implemented effectively may go to solve many challenges faced by the agriculture sector. At first instance, it reduces the farmers suicides that happen due to vagaries of nature and on the other hand it reduces the financial burden of the government that is spending thousand crores together in the name of farm loan waiver. The Pradhan Mantri Fasal Bima Yojana introduced in 2016 is more favorable to the insurance companies instead of protecting the farmers' interest. The following measures are needed for its effective implementation.

- The government should pay the premiums of crop insurance on behalf of the farmers and insure their crop instead of going to loan waiver scheme. Because farmers are not in a position to pay the premium of crop insurance.
- Scientific methods should be adopted in calculating the crop loss of the individual farmers. It is not based on the district or taluka as a whole. It must be done by field to field to know the real loss.
- Delay in settlement of claims are to be mitigated within a month of reporting of crop loss, otherwise it may lead to increase in the financial burden of the farmers.
- The insurance coverage should be continued till the goods are sold out in the market at reasonable prices. If prices come down below the MSP, the difference between MSP and Market price should be paid by the insurance companies. This may help to reduce the burden on the government, that they are spending crores together in the name of loan waiver scheme.
- Awareness should be create among the farmers about the benefits of crop insurance, amount of premium, extent of government share etc., to avoid the perplexity. In some cases the farmers are unaware about the money deducted from their account to pay the premiums to insurance companies by banks. Under this circumstances the question of claim doesn't arises.
- Loan waiver is not a permanent solution for the farmers suicides in the country. Instead of going for loan waiver government use that money to invest in agri-infrastructure facilities such as improving marketing facilities that enable the farmers to get remunerative prices for their produce, improvement of irrigational facilities, mechanization of agriculture etc.
- Dependence of agriculture on rainfall must be reduced to avoid the vagaries of nature on agriculture sector. Because it is the major cause of crop failure and farmers suicides. Hence, by developing water shed management, rainwater harvesting, de-silting of tanks, filling of tanks with river water, constructing check dams to small rivers and streams, drip irrigation, sprinkler irrigation, air water dew by using plastic tray etc., to be adopted to increase water use.
- Instead of providing direct loans the government should supply all kinds of necessary inputs at subsidized rate to farmers. It enables them to undertake agricultural operations in time.
- The loan waiver will create a belief in the mindset of farmers that every year government will waive off their loan, why should we repay the loan to the banks? They could default with liberty that witness into decline in the recovery rate of loans by banks, leading to financial crunch. Further, it is going to hamper the financial condition of the government and financial institutions. The banks NPA will increases due to non-reimbursement of waived money immediately by the government. This reduces their capacity of lending for next season. Hence, loan waiver will not give any fruitful results to agriculture sector.

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**Introduction :-**

Farming systems and water resources are becoming increasingly vulnerable to climate change and climate variability, although there is significant regional variation within and across countries. The most recent Intergovernmental Panel on Climate Change assessment (IPCC, 2008) and government reports confirm that this trend is expected to continue.

Climate change projections make clear that changes in water availability, the timing and seasonality of precipitation, and warming, as well as the growing incidence and severity of floods and droughts, will require high levels of adaptive responses to address these issues so as to enhance the resilience of agricultural systems to produce enough food, fiber and fuel. However, it should be stressed that in some countries (that are constrained at present in terms of expanding agriculture) climate change may lead to benefits and positive opportunities for agriculture. Better understanding of climate variability and extension of risk management approaches in agriculture to existing climate variability, can help build a more solid foundation for addressing climate change in the future.

The increasing frequency and severity of drought and flood events is leading to higher budgetary costs for governments in supporting affected farmers and rural communities, and an increase in farmer insurance costs. The rising cost of flood and drought relief, for agriculture and society as a whole, is exacerbated in some cases by the fragmentation of responsibility and the lack of policy coherence in agricultural, environmental, land and water policies to address these problems.

Where farmers are guaranteed government support in times of flood and drought disasters this does not give farmers the right incentives to improve self-reliance and risk management for adverse events (moral hazard). Hence, greater policy attention and investment will be required in water control (for floods) and water retention (droughts) management. There is also a need for farm practices that can reduce economic losses and lead to better management of water flows and stocks on farmland, taking into account the impact on any water entitlements that are established.

Given the prospect for increasing flood events associated with climate change, farmland is likely to play an important role in mitigation and adaptation strategies for flood risk management. Policies that are able to combine flood risk management with other objectives, such as for nature conservation, the protection of natural resources and agricultural production, are likely to offer the best long term solutions. Even without the changes associated with climate change, the frequency of flood events has increased along with the damages. Human alterations of the hydrological characteristics of watersheds has increased runoff and narrowed channels. Land-use policies have also encouraged urbanization in areas at risk to flooding events, and thus increased the economic cost associated with a given flood event.

Where land management practices are known to result in serious flood risk, there is a call for regulation and compliance with "good practice". In cases where farmers purposefully manage land to retain and store potential floodwater to reduce flood risk for

The benefit of others, there can be scope for policies to reward them accordingly, although this may be highly localized. Integrating sustainable water resource management in agriculture within the broader context of regional land use planning is also important as a broader economy-wide mitigation strategy to address flood risks (e.g. the conversion of farmland to urban uses can raise flood costs as farmland has the potential to act as a flood sink).

The expectation is that drought events will occur more frequently in the future as a result of greater climate variability. So improving the resilience of agriculture to droughts will also be important, including by developing water storage capacity. It is essential in drought prone areas for agriculture to improve its water use efficiency (or even consider abandoning agriculture completely in more extreme cases), in part, to free water for other users and environmental purposes. This might be achieved through:

- Reducing leakages in delivery systems;
- Developing on-farm rain harvesting practices and systems, e.g. conservation tillage;

- Making greater use of recycled sewage and drainage water and desalinated water;
- Improving soil moisture measurement;
- Increasing adoption of efficient water application technologies, such as nanotechnologies;
- Encouraging greater adoption of drought-resistant cultivars; and,
- Recharging groundwater during times of low seasonal water demand.

In many cases these practices and technologies to make water savings are already known. However, it is the barriers to their adoption, such as a lack of farmer training, that are an important challenge for policy makers.

### Introduction of sabarmati river :

Sabarmati river is one of the major west flowing rivers of India. The basin drains an area of 21,565 km<sup>2</sup>, of which 17,441 km<sup>2</sup> lies in the state of Gujarat and 4,124 km<sup>2</sup> in Rajasthan. The pseudo-natural mean annual runoff is estimated to be 3,810 million cubic meters corresponding to pre- 1960 conditions. With a relatively large population of 11.75 million in 2001, this gives a per capita availability of water of 324 cubic meters per person per annum, which is lowest among the basins of India. As a result of the rapid pace of socio-economic development, the demand for water has experienced a steady increase for irrigation as well as domestic and industrial use.

Agriculture is the dominant land use with forest and 'land not put to agriculture' use accounting for only about 42% of the basin area. The rain-fed and irrigated agriculture have almost equal share. The annual irrigation from existing major, medium and minor surface water projects\* is presently of the order of 0.43 million ha. while that from groundwater through public, private tube wells and dug wells is roughly estimated to be a little over 0.70 million ha. Source-wise, ground water has a major share in terms of area under irrigated agriculture. The present level of irrigation has been made possible mainly through inter-basin transfer of surface waters from the adjacent Mahi river. Additional import from Narmada river has further augmented the supply and more imports are proposed by Gujarat State.

### Surface water :

Around 1960, in average condition as per the model, the withdrawal of surface water was only 4 percent of the total inputs, and return flow contributed only 2 percent of inputs, while the base flow was available from August to May. This is considered to represent near pristine conditions.

In the present situation with average rainfall, return flows contribute 9 percent of total inputs and withdrawals are equal to 35 percent of the inputs. Thus both of these may lead to risk of pollution of downstream waters.

In the future scenarios (F-I to F-VIII), although further import of Narmada river waters could maintain the withdrawal to input ratio at around the present figure, the return flows would constitute about 12 to 13 percent of total inputs, thus indicating a somewhat larger hazard of pollution of groundwater. However, the base flow availability improves.

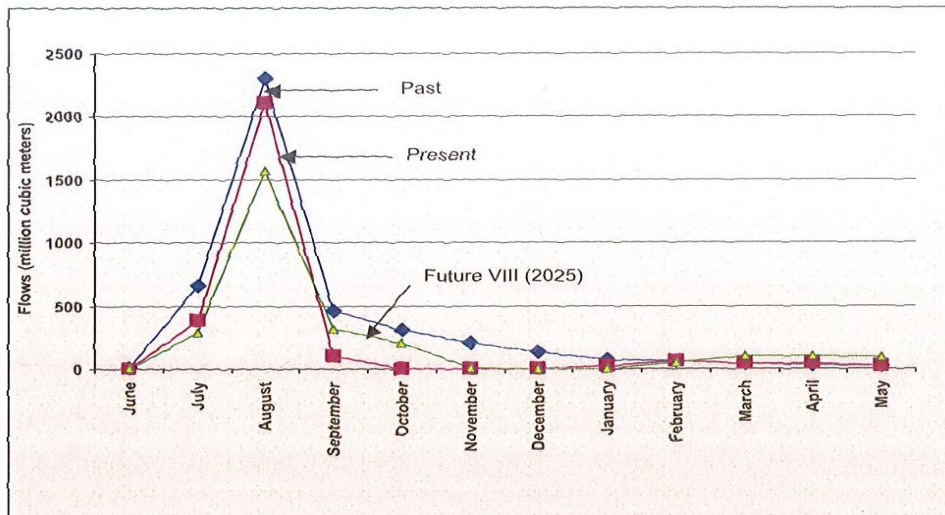
The total sustainable river flows (after providing for the natural and induced recharge from river to groundwater) and their monthly distribution is shown in Table 2. The monthly river flows in selected three scenarios are shown in Figure-1. The low flows (November to May) would be particularly affected by the pattern of development.

**Table 1**

### Requirements of Natural and/or Induced Recharge from River to Groundwater and Groundwater Pumping into Surface Canals Under Various Scenarios (ICYn<sup>1</sup>)

Description	Past (1960)	Present (1995)	F-I	F-II	F-III	F-IV	F-V	F-VI	F-VII	F-VIII
Natural & induced recharge from river to Groundwater	0	650	3,415	3,150	3,025	2,450	1,040	810	220	1,650

Groundwater pumping to surface canals for meeting shortages in surface irrigation	9.99	1,099	1,600	1,850	1,818	1,482	922	1,383	997	1,367
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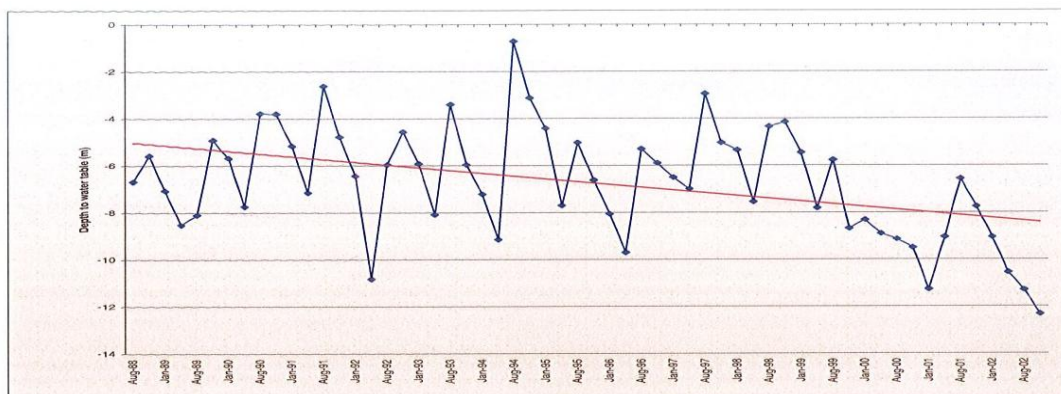


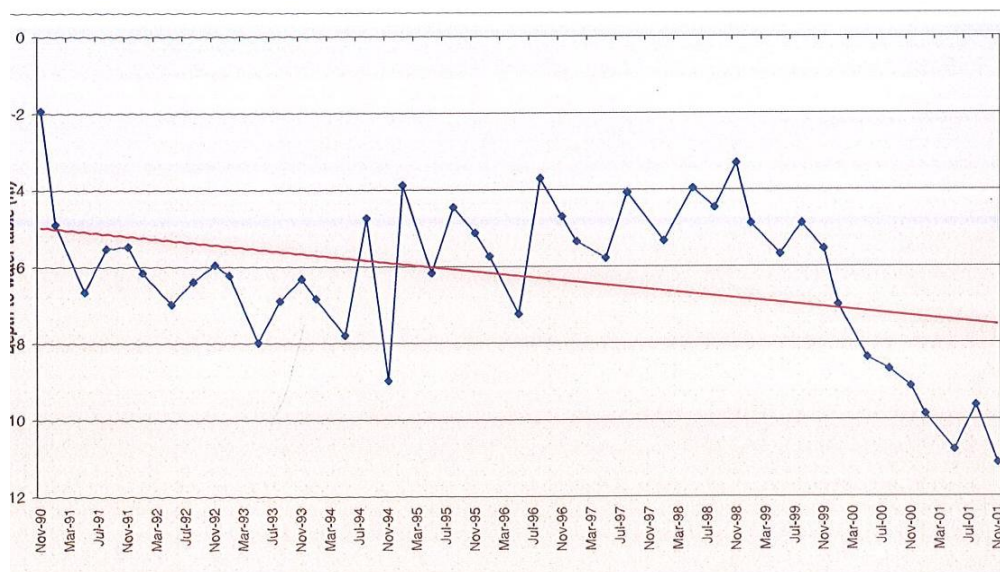
**Figure No. 1 Monthly River Flows in Selected Three Scenarios**

**Groundwater**

In Sabarmati basin, extensive groundwater use has been practiced. In the ‘present’ situation, return flows, natural and ‘human induced’ together, constitute 54 percent of the inputs. At the same time withdrawals are 112 percent of the input, thus signifying mining of groundwater and unsustainable groundwater balance, which would be made good by further surface to ground water transfers. The situation would improve slightly in future due to large additional Narmada imports. But even then, return flow would continue to constitute about 40 percent of the inputs, indicating risk of pollution. The withdrawals would constitute 66 to 86 percent of the input, thus leaving only small quantity to contribute to the base flow.

The withdrawals for both surface and groundwater for different purposes and for different scenarios are shown in Figure 15. These withdrawals depend not on the net irrigation provided in each scenario, but these are more sensitive to the seasonal distribution of the net irrigated area, because kharif irrigation requires comparatively less water.





**Figure No. 3 Ground water fluctuations in Sabarmati Basin Nov. 1990 to Nov. 2001)**

### Groundwater Pumping and Induced Recharge :

The heavy withdrawals from surface and groundwater represent the demands, which are to be fulfilled from the available surface water and groundwater. When the surface water was not available, additional pumping from groundwater to the surface canals was required to meet the demands. But, because of these heavy groundwater withdrawals, the sustainability of the groundwater storage, under the average recharge conditions is disturbed. This required the assumption of natural and induced recharge from surface to ground waters, as has been already discussed.

The scenario-wise position about the need for groundwater pumping into canals for meeting deficits in surface water irrigation and of natural and induced recharge to make ground water position sustainable is given in Table 1. The groundwater pumping to canals is necessary mostly in June and in the low flow months, whereas the natural and induced recharge from river to groundwater occurs mostly during the high flow months.

### Water Situation Indicators

Water stress for a river basin is defined in terms of ratio of average annual water withdrawals for human use (agriculture, D&I and other uses) as a percentage of the total water availability i.e. mean annual run off of the basin. In simple terms it reflects pressure created by water withdrawals on basin water resources. Water stress at a country level can be arrived at by aggregating the withdrawals and comparing it to total renewable water resources of the country. Water stress begins when withdrawals of freshwater rise above 10 percent of renewable resources. Medium to high stress is set to occur when water use exceeds 20 percent of renewable resources. Countries generally experience high water stress when water use exceeds renewable resource by 40% (ADB, 2004). At such levels, their patterns of use may not be sustainable, and water scarcity is likely to become the limiting factor to economic growth.

### Water Situation Indicators (WSI)

A survey of indicators of water stress mentioned in International literature was made. The three main types recommended in recent years are:

- (a) The water stress indicator (WSI) used in international literature is one based on Alcamo, etal, (2002), and is defined as  $WSI = \text{Withdrawal} / \text{Mean Annual (natural) Runoff (MAR)}$



(b) Smakhtin, et.al, (2002) suggested a modification to account for water use for maintaining ecology and environment  $WSI = \text{Withdrawal} / (\text{MAR} - \text{Environmental water requirement for aquatic eco-system})$

(c) At the 3<sup>rd</sup> World Water Forum in March 2003, ICID suggested the following relationship  $WSI = \text{Withdrawal} / (\text{MAR} - \text{Society's need for food, people and nature as evidenced by consumptive use})$ . The following indicators have been proposed in this study undertaken under CPSP in Indian basins.

The views of indicators is primarily aimed at abstracting the impact of human use on water availability and extend the outcome of sample basins to recommend policies on the basis of similarities and dissimilarities in the state of overall situation at the basin level. The following four indicators of the “water situation” are being used.

Indicator 1: Withdrawals/ Total input to surface water

Indicator 2: Returns/ total input to surface water

Indicator 3: Withdrawals/ total input to groundwater

Indicator 4: Returns/ total input to groundwater

These indicators have been considered more relevant to Indian situation due to the following reasons.

1. There is a large groundwater use in India. One needs indicators, which reflect water uses from both surface and ground water sources.
2. The WSI as defined based on ‘withdrawals’; out of which a substantial part may return. Either one needs to consider the returns as an additional resource, adding to the natural runoff, or, one needs to consider the ‘net consumptive use’ rather than withdrawals.
3. The change suggested by Smakhtin, et.al presupposes that the environmental water flow requirement for aquatic eco-system has an overriding priority, and only the rest of the water flow is available for any use for terrestrial natural eco-systems, food or people. This does not appear appropriate for many basins that are water-deficit or at a threshold level. The in-stream environmental uses is in terms of flow requirement and is not a consumptive use as in other cases and can instead be considered as one of the requirements, competing with others.

The methodology for computing the MAR by considering the withdrawals and returns has not been explained by Alcamo and Smakhtin. Since large land use changes can also affect the natural supply, this becomes more complex. Either a ‘natural’ land use, which does not allow for human interventions through agriculture, or a ‘pseudo-natural’ condition, where agriculture is allowed but irrigation is not, would have to be defined for this purpose. In case of Sabarmati basin, “past” conditions may correspond to a ‘pseudo-natural’ condition

Instead of basing the indicator on gross withdrawals (numerator) and gross inputs (including human induced returns), these could also have been based on the net consumption (numerator) and the natural inputs (under the pseudo-natural conditions, without human interventions other than land use modification in the denominator).

The proposed indicators have been used to depict the water situation in Sabarmati basin in quantitative as well as qualitative terms. Indicators 1 and 3 depict the level of withdrawals as fractions of total water available in surface and groundwater system respectively, while indicators 2 and 4 depict the potential hazards to water quality in surface and ground water systems respectively.

## Water Situation Indicators of Sabarmati River Basin

The water related status of the Sabarmati basin, under the past, present and alternate future scenarios was studied under the average precipitation conditions. These studies used artificial recharge of river waters into the groundwater to obtain a stable ground water regime.

### Conclusion

- Climatic change in a nature and agriculture sectors is of the same order as the quantum of annual river flow. It therefore, follows that reduction of non-beneficial ET through rainwater harvesting, soil and water management would be a potential strategy for reducing consumptive use.
- Import of Narmada water is necessary not only to sustain the present level of withdrawals but also to meet the increased future needs, including that for improvement of low flows.
- Present groundwater use is unsustainable. While the situation would improve slightly in future



due to large additional Narmada imports, composition of return flow indicates much higher risk of groundwater pollution.

- Scope for changes in cropping pattern towards growing crops requiring less water and higher commercial value and adoption of efficient methods of irrigation and water management hold promise to mitigate the severe water stress conditions.
- The shortage of surface water and over use of groundwater in the basin would require additional imports in future from Narmada despite using soil and water conservation and other water saving measures such as improving surface water

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Tq. Dist. Beed.

### Introduction:-

Development essentially is a dynamic process which transforms an economy and society from a relatively backward state to a more advanced state. The transition encompasses several dimensions such as growth in productivity and income, structural change in the economy and the society, institutional changes, changes in attitudes and values of people and even in customs and social practices. However, the bottom line of the process is an improvement of the quality of life of the people at large. In other words, the process of change will qualify as development only if it results into an improvement in the quality of life of the people reflected in better nutrition and health standard, greater opportunity to be educated and elimination of deprivation from participation in social and economic life. Agriculture plays an important and vital role in any economy generally, for developing countries particularly and for a country like India. Basically with 143 million hectares of land as net sown area, the highest percentage of land under cultivation in the world. The country accounts for 17 percent of world's population and ranks at second largest populated country. The country has about 69 percent of population living in its rural areas and villages and the sole source of their livelihood is agriculture and allied activities. Cereal and many ground crop production in agriculture has beset many problems and many scholars have admitted that agricultural diversification towards high value commodities will strengthen agriculture growth in future and will result high remunerative returns to farmers. Again the horticulture and other allied activities have lot of backward and forward linkages which resulted wide employment opportunities and income flow, equally distributed to all in these rural areas.

India's agriculture production has been increasing on average at about 3.6 percent annually since 2011, sustained by improved access to inputs such as fertilizers and seeds, as well as better irrigation and credit coverage. The sector has also been diversifying from grains towards pulses, fruit, vegetables and livestock products, largely driven by evolving demographics, urbanization and changing demand patterns. India has achieved a significant fall in the proportion of the population that is undernourished, from around 24 percent in 1990-92 to 15 percent in 2014-16. Moreover, it has also emerged as a major agricultural exporter of several key commodities, currently being the largest exporter of rice globally and the second largest of cotton. But for these past successes to continue into the future, India will need to accelerate existing reform efforts and to launch hold new policy initiatives.

Agricultural policies in India are designed and implemented states have constitutional responsibility for many aspects of agriculture, but the central government plays an important role by developing national approaches to policy and providing the necessary funds for implementation at the state level. Nevertheless, no sufficiently strong mechanism exists to bring state and central level policy makers together to discuss problems, design.

### Solutions and monitor Performance.

#### Rural Development Policies: A Brief History

- Community Development Programs: It was only after independence that rural development was given top priority. Objectives in this regard were spelt out in the directive principles of state policy in part IV of the constitution pilot projects of community development at Etawah nilokheri and Faridabad provided valuable lessons in designing the community development programme. The first five year plan clearly stated, community development is the method and rural extension the agency through which the five year plan seeks to initiate a process of transformation of the social and economic life of the villages. The community Development programme commenced in 1952 was an integral part of the first five year plan. It was a multipurpose and comprehensive program which symbolized on integrated approach to rural development. It was method of community education and mobilization for within the broad framework of programs, indicated at the national level, local communities on the basis of felt needs, had to determine their priorities, identify their programs, work

out solutions and exert to implement them. In this process, the community would be assisted by an external agency, be it governmental or otherwise.

At the central level the community development program was entrusted to the community projects administration set up within the planning commission and headed by an administrator. Though the community development program was shaped and funded by the central government, implementation was through the state government's developmental commissioner who functioned as a coordinator. Since several departments were involved in the community development program, At the district level there was the collector and the block administration consisted of the block level officer, extension personnel, village level workers and auxiliary staff. The operative mechanism for the community development program was the 55 community projects, each covering about 300 village communities which by October 1953, through the national extension service covered entire rural India.

By late fifties, it was realized that something was seriously wrong with community development program. Instead of promoting self-motivated "self-help" it continued to be not just official motivated self-help but a government's program run by bureaucrats. With overriding concern for economic growth people were side tracked and specialists come to hold the center stage. It was no more a people's program but bureaucratic mobilization to fulfill targets set by the centralized planning. Periodical evolution of progress of rural development on the basis of the community development program led to changes in two directions. Firstly there was the shift in emphasis to economic development, especially agricultural production secondly; there was the broadening of popular participation for democratic decentralization.

**Panchayati Raj Institutions:** Panchayati Raj Institutions were devised as a three tiered system of democratic institutions consisting of elected representatives at the village, block and district levels. The decentralized machinery of development administration was placed under the control of the popular institutions. Though it was heralded as political revolution that brought democracy to the door steps of the people and ensured their participation in developmental activity, yet there is no clarity regarding the concept itself. Apart from this these intuitions are bound to be judged by the operational efficiency of their administrative machinery. It is here that the rub lies. Within five years, panchayat raj institutions began to stagnate and soon to decline. The trend continued in the eighties and attempts were made to restructure and galvanize them into purposive action.

As with the community Development programs here too, bureaucracy is dominant and powerful while the people's voice is feeble and often stifled. Given the extent of political factionalism, corruption, inefficiency, casteism and parochialism it is not surprising that Panchayat Raj Institutions have been described as caricatures of local government. Panchayat Raj is an Institutionalized mechanism for rural development. Its twin objectives are therefore, development and democracy. In fact, it seeks development through democracy or at least an equilibrium between the demands of development and the pressures of democracy. Often, the state government, being constitutionally responsible for rural development, is not willing to decentralize but only to delegate. It therefore views panchayati Raj largely as its agency, operating in its shadow and under its control. On the administration front the failure could be explained in terms of excessive centralized bureaucratic control as also the power-cum-development politics.

**-Agriculture and allied Activities :** It may be recalled that in 1959 the first team of American experts, through the food foundation, submitted its report entitled. India's food crisis and steps to meet it. It opined that efforts should be concentrated where results will be the greatest. Thus a new agricultural strategy was envisaged to step up food production. Through its report of 1963, the second team assisted in planning the Intensive. Agricultural District program. The administrative mechanism for the new strategy. The third plan incorporated the (IADP) which was to be taken up in one district in each state. In 1964m the IADP concept was extended to other district as the intensive agricultural areas program (IAAP). The IADP in its extended ad diluted from as IAAP failed like the community Development program (CDP). The food problem assumed a new urgency in view of drought conditions. From 1964-67 G. Subramanian, the union food and agricultural minister (1964-67) evolved a new agricultural strategy which harnessed science and technology to rise farm productivity. Agricultural universities and research centers were set up and agricultural scientists were involved in the (IAAP).

These programs, it was claimed, ushered in the green revolution. Nevertheless, there were administrative weaknesses, The BDO hardly had the requisite qualifications or experience, while the

village level workers had neither the time nor inclination for such work. Delays in execution, disappointment of beneficiaries and demoralization of functionaries are bound to flow from lack of delegation of adequate financial and administrative powers to lower level officials. Nevertheless, the IADP did take science and technology closer to the farmers and induced a perceptive change in their attitude to agriculture. The agricultural strategy of concentration of inputs in selected regions led to regional and class imbalances.

**Anti- Poverty Programs:**In the first three plans, the accent was on increased production so as to obtain a large investible surplus through the plan process. In the fourth plan, the affection shifted to the weaker sections because it was realized that the gains of development did not percolate to the poor. The basic problem was how to achieve rapid growth with distributive justice. The area based and Target group approach was adopted and an number of programs devised. The sits plan recognized that rural development in its widest sense, so as to embrace, a part from crop production all allied activities. This integrated development should encompass both spatial and functional integration of all relevant programs bearing on increased agricultural production and reduction of unemployment. The minimum needs program was implemented on a massive scale during to fifth plan.

Alleviation of rural poverty was the prime objective of the sixth plan 1980 to 85 for it was found that small and marginal farmers who constitute over 70 percent of the land holders held barely 24 percent of the land and that the top 10 percent held as much as 51% of the assets while the lower 40 percent held barely 20% . The program of land reforms, started in the fifties, had made no progress. Regional imbalances were glaring and poverty was wades press and disconcerting. So the Integrated Rural Development program (IRDP) was started in Oct. 1980. It brought together earlier rural development programs which many a time operated simultaneously in the same area and for the same target group. This territorial overlap combined with different funding arrangements created problems of monitoring and accounting. Also schemes like national rural Employment program (NREP) and Rural Landless Employment Guarantee program (RLEGP) were introduced.

**Conclusion:** Over the years the functioning of rural development policies and programs and their impact on the poor has attracted a great deal of attention. Numerous studies several under the auspices and servers have highlighted their achievements as well as weaknesses. A healthy and wholesome feature is the extraordinarily free and open discussion of deficiencies of particular schemes, the relative merits of different interventions and suggestions for restructuring and reorientation. However, they have received strong critiques as well.

Official claims of the number of beneficiaries, works carried out, additions to productive assets and employment generated are unreliable and exaggerated. Poor among the beneficiaries. Leakages due to inappropriate works, inefficient implementation and corruption are high. Quality of assets provided under these programs is poor and their impact on income level of beneficiaries dubious. Assets and schemes are frequently not appropriate to the needs and potentials of particular regions or groups. There is little consultation with, not to speak of involvement of local communities generally and target groups in particular, in deciding and implementing schemes.

Lack of accountability remains a major problem. The structure, content and funding of these programs remains mostly in the hands of control government. There is considerable overlap among these schemes as well as between them and development schemes included under the normal state plans. Typically each program is administered by a separate agency each with its own line hierarchy and operating independently. These features, taken together with the rigidity of control guidelines, make for fragmentation and duplication of schemes. Co-ordination is difficult; so is monitoring of accomplishments in terms of efficacy of targeting, quality of works actually completed and impact on the beneficiaries.

The programs tend to emphasize loans and subsidies and provision of current wage employment rather than ensuring that they are used to augment productive capacity for achieving a higher level of employment and income on sustained basis. The selection of beneficiaries, the distribution of loans and subsidies, and the recovery of loans offer much scope for patronage and corruption at the political and bureaucratic levels.

Rural development policies predominantly aimed at government and administration's central role in development which was evident in the implementation of community development programs however the increasing failures due to political and bureaucratic corruption brought forth the idea of democratic decentralization to capture people's felt needs. Thus; Panchyat Raj Institutions were introduced as mechanisms for guiding rural development policies. In addition, many poverty-

alleviation programs were introduced for the adequate development of rural India. Over the years, in the subsequent five year plans introduction of many new programs and revision of existing programs took place as part of rural development policy.

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## Intensity of irrigation in Nandurbar district (2001-2002 and 2011-2012)

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### Summary:-

In present research essay, the intensity of irrigation in Nandurbar district has been studied. The intensity of irrigation has been calculated by considering the net irrigation area and net area.

It has also been studied how much the effect of this irrigation intensity is on the crops. In the research essay, the influence of irrigation by the selection of Nandurbar district is influenced by the well, capsule, ponds, rivers and canals to study the intensity of irrigation.

### Preface: -

Human beings have an urgent need for water to survive. The use of this water is necessary for the survival of man as well as for preparing his own food; they need water irrigation for crop, which requires water irrigation in various ways,

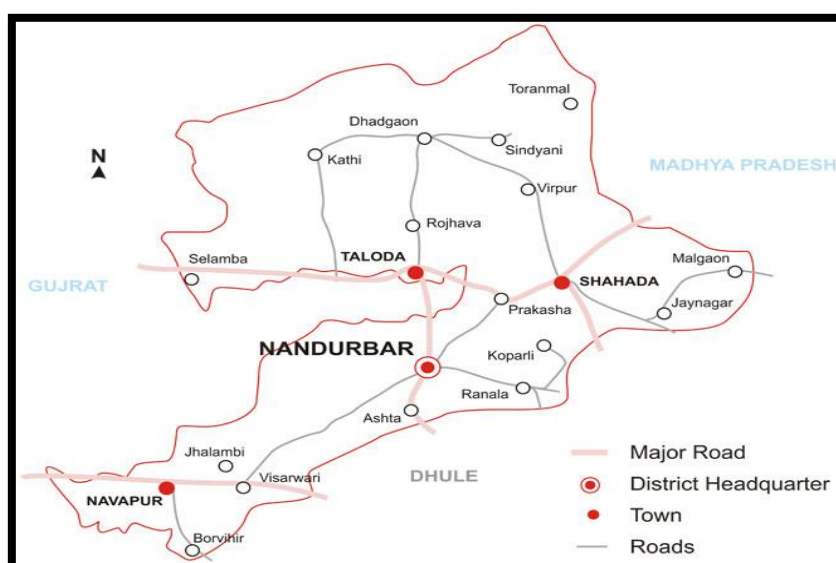
The intensity of water conservation in Nandurbar district is being studied so that it will continue to be intensified due to the continuity of these sources in future, so that it has to study the intensity of irrigation at the present time, so that it will utilize various techniques to increase intensity of irrigation.

### Study Area: -

The study area of the research paper is the Nandurbar district of the Khandesh region of Maharashtra State, which extends between 21° 00' North Latitude and 73° 31' to 74° 32' East Longitude. The district Nandurbar is generally spherical and it is a part of the Deccan Plateau. Most of the tribal communities are inhabited. The northern boundary of the district is bounded by Madhya Pradesh State, on the north and west the border of Gujarat is bounded along the south side of Dhule district.

As per 2011 census, the total population of the district is 16,48,995, of which 8,33,170 are male and 8,15,125 are females. Nandurbar District is 1.62 % of the total area of the state, i.e. 5034.23 Sq. km. The district is ranked 31st in the state's serial order, with a total of 6 Tahasil in the district

### Location and extension Nandurbar District



**Aim:-**

1. Study the sources of water conservation.
2. Study various crop changes according to irrigation.
3. Study the capacity of irrigation.
4. Study the increase in irrigation.(2001-2002 to 2011-2012)
5. Study the impact of irrigation intensity.

**Methodology:-**

In this research essay, statistics have been collected by the regional survey and analyzed those statistics. In this essay, all the districts have been taken from the administrative perspective.

This research has been used to create a map according to map histology technique statistics in the essay.

The following procedure has also been adopted in this research essay. Formulas have been used to determine the intensity of irrigation, net irrigation area and net area.  
 Irrigation Intensity = (Gross Irrigated Area / Gross Cropped Area) × 100

Also, the data received from the secondary sources such as Social economic Analysis Nandurbar district, etc. has been used.

**Analysis: -**

Water is the life, irrigation, is the irrigation scheme that is called water by utilizing various sources and using it for farming, drinking water, irregularities and inadequacy of rainfall, crops need to be supplied. Agricultural business in Maharashtra is very important place. 70% of the people in the country are dependent on agriculture. Therefore, increasing the intake of irrigation capacity to meet the food requirements to increase the product and increase crop production capacity is an important factor.

**1) Source of irrigation: -**

Water conservation in Nandurbar district is done through various mediums. The sources of water consignment include well, tube-well, canal etc. and this includes the natural body of rain water.

On the basis of these practices, the development of the cultivation of water is very high. In Nandurbar district, there is a lot of increase in the medium of irrigation. During 2001-2011, irrigation sources have seen a lot of change. The number of wells in 2001-2002 was 31430 and in 2011-12 it was 76080. The reason for this increase is that this type is very useful for the medium and small farmers in terms of water conservation. Along with the well, the use of couplings in 2011-2012 is also seen to be very large.

**2) Intensity of irrigation in Nandurbar district (2001-2002 and 2011-2012)**

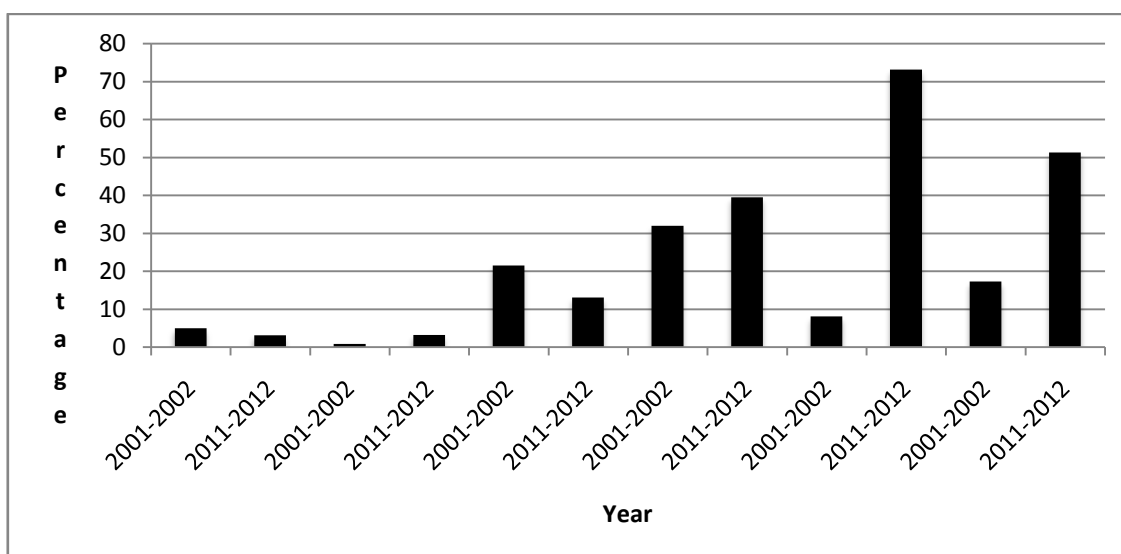
The following information was collected for the intensity of water conservation in the district of Nandurbar and the following formulas have been used to intensify water irrigation for this statistical analysis.

Formula: -

$$\text{Irrigation Intensity} = (\text{Gross Irrigated Area} / \text{Gross Cropped Area}) \times 100$$

S.N.	Tahasil Name	Year	Gross Irrigated Area (in Hector)	Gross Cropped Area (in Hector)	Percentage
1	Akkalkuwa	2001-2002	1684	33922	4.96
		2011-2012	1182	38304	3.08
2	Akrani	2001-2002	204	24275	0.84
		2011-2012	579	18259	3.17
3	Taloda	2001-2002	6094	28354	21.49
		2011-2012	3388	25894	13.08
4	Shahada	2001-2002	29159	91364	31.91
		2011-2012	35636	90273	39.47
5	Nandurbar	2001-2002	6159	76424	8.05
		2011-2012	61647	84260	73.16
6	Navapur	2001-2002	10451	60533	17.26
		2011-2012	31297	60985	51.31

### Intensity of irrigation in Nandurbar district (2001-2002 and 2011-2012)



During the year 2001-2002 and 2011-2012, the study of intensity of irrigation in Nandurbar district was found that in 2001-02, Akkalkuwatahsil was 4.96%, Acronyms 0.84%, Taloda 21.49%, Shahada 31.9 1% Nandurbar 8.05%, Nawapur 17.26% were found. In the year 2011-12, the Akkalkuwa irrigation intensity decreased by 1.88%, the abnormality was increased by 2.33%, Taloda decreased by 8.41%, Shahada rose by 7.56%, Nandurbar increased by 65.11%, Navapur was increased by 34.05%

It was found that the intensity of irrigation in Nandurbar district was found to increase irrigation intensity in 2011-2012 compared to 2001-2002.

#### Conclusion: -

In the research paper submitted under the Nandurbar district, the study of irrigation intensity would be done. The following conclusions have been drawn from this study.

- 1) Nandurbar district uses water from the well. Water irrigation is seen through the well.
- 2) Most farmers in the district get sugarcane and maize crops, because of the increase in the availability of irrigation facilities as well as the use of modern techniques to maximize farming.
- 3) Irrigation intensity is higher in Shahada Nandurbar Navapur in Nandurbar district.
- 4) Sugarcane production is being grown in excessive quantity due to sugar factories.
- 5) Due to the dam built on Tapi river near Prakasa village, irrigation is done by river water in prakashavillage, Shahada

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## Economic Empowerment Of Women Through Dairy Co-operative

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### I. Introduction:

“Women constitute half of the world’s population, perform for nearly two thirds of work hours, receive one tenth of world’s income and own less than one hundredth percent of world’s property. Half of the Indian population too is women. Women have always been discriminated and have suffered. And to a great extent they are suffering in silence. Self sacrifice and self denial add to their nobility and fortitude, yet they have been subjected to all inequities, indignities, inequalities and discrimination. Judicial activism through a process of affirmative action and protective discrimination is the need of the hour. Women empowerment refers to increasing the spiritual, political, social and economic strength of women. It often involves empowering and developing the women’s confidence in their capabilities.

Under the trickle down theory in the planning process, it was expected that women will equally benefit along with men. But actually women have lagged behind in almost all sectors. From the last decades Govt. has emphasize towards growth and development of women. For the empowerment of women Govt. has to allocate resources and formulated various policies. Basically due to lack of economic independence, women in India are keeping aside from playing participatory role in nation building.

Dairy co-operative is one of the most significant tools to adopt participatory approach for the economic empowerment of women. It is an important instrument for improving the life of rural women on various social components. Today Indian women play an important role in milk collection, calves rearing, watering etc. They are playing important role in managing co-operative dairy industries because they try to maintain managing quality and clean milk produce. Women are more active in the dairy business activities because of motivation and moral aspects.

NDDB is continuously supporting milk unions to increase women’s membership and enhance the role of women in dairy co-operative. The number of women in governance at dairy co-operative has increased from 1,31,388 during 2000-01 to 1,97,958 during 2004-05 (NDDB 2005). Progress of dairy co-operatives on key parameters is shown that in the year 2005-06 there are 1,17,575 DCS in India having 12,416 thousand farmer members and 3,194 thousand women members. The ratio of farmer member and women member is near about 74:26. During the year 2008-2009 the number of DCS reached to the level of 133349 by increasing 13.41% over 2005-06. The numbers of farmer members and women members are increased up to 13893 thousand and 3916 thousand respectively. The number of farmer members increased by 11.90% over 2005-06, where as women members increased by 22.60%. During the year 2008-09 the ratio of farmer members and women members is 72:28, which shows the vital role of women in Dairy Co-operatives.

### II. Objectives and methodology of the study :

A Study of empowerment of women through Dairy Co-operatives has been undertaken due to the importance of the women co-operative dairy industry in rural sector.

The present study has been aimed to fulfill the following objectives

- 1 **To study the Problems faced by women in dairy co-operatives**
- 2 **To know the Expenditure pattern of Milk Income by sample households**
- 3 **To understand Social and economic impact of dairy co-operatives**
- 4 To analyze the powers in the hands of women in respect of dairy industry.
- 5 To make the study of problems faced by women in dairy co-operatives.

### III. Methodology and data collection:

For the present study I have chose the operational area of Rajarambapu Patil Sahakari Dudh Sangh Ltd. Islampur. There were 54 women PDCS affiliated to RBP Dudh Sangh, out of which 10 PDCS were purposively selected. Then complete list of members of selected 10 PDCSs was obtained from the office of the PDCS. Out of total members 5 members were purposively selected from each PDCS.

Researcher has collected primary data from selected dairy unit by questionnaire, direct interview and survey method. Secondary data collected from library, daily news papers and annual reports of the PDCS and RBP milk union.

**IV. Results and discussion:**

**i) Role of Women in Dairy Industry :**

Today Indian women play an important role in milk collection, calves rearing, watering etc. Western Maharashtra and particularly rural part of the Sangli and Kolhapur District is famous for Co-operative Dudh Sanghs .Under the dairy development programme there are number of programmes for women’s training and active participation in dairy industry. There is a very good example of Self Help Groups working by these milk societies for supplying financial assistance and loan facilities. Women’s are playing important role in managing co-operative dairy industries because they try to maintain managing quality and clean milk produce .Women’s are more active in the dairy business activities because of motivation and moral aspect .

The livestock farming plays a significant role in accelerating the rural economic growth in the developing countries like India. Women are the king pins in home and farm economy in rural areas. In dairying 750 lakhs women are employed as compared to 50 lakhs men. According to 1986 figures, out of 4.97 million unemployed in rural India, 1.21 million are women. In 1988-89 , 7.14 million female laborers were available to work in rural areas . Women provide much of the unpaid family labour to agriculture, including animal husbandry. Having been highly employed in livestock rearing activities rural women were found to devote 90 % of their time on cattle care, making it more or less a female domain.

Dairy farming is considered as an extension of domestic activities like feeding and watering animals , breeding of fodder from field , cleaning of animals and sheds , preparation of cow dung cakes , milking ,milk products making , marketing of milk and milk products are performed and decided upon by women .

Dairy industry is allied industry based on agriculture. It gives employment to women and sources of income for rural area. It plays important role in rural development. So, I have decided to make study on this area and to understand the various problems in women Co-operative Dairy societies.

**Table No.1**

**Statement showing Source-wise Distribution of Income of the sample households**

Source	Income in Rs.	% to total
Agriculture	64400	28
Animal Husbandry	131100	57
Agriculture Labour and other	34500	15
Total	230000	100

From the table no. 1 it is clear that the share of income from animal husbandry stood first by occurring 57% income followed by agriculture income 28%. However 15% % of the respondents still depend upon agricultural laboring and from other sources such as petty trade, sale of vegetables and sale of desi eggs, construction and well digging labour etc.

Majority of respondents said that there is regularity of income throughout the year from animal husbandry. On the other hand, there is uncertainty and seasonality in the income from other sources.

**Table No. 2**

**Statement showing expenditure pattern of Milk Income by sample households**

Particulars	Yes (no. of Respondent)	No (no. of Respondent)
Domestic Expenses	50	--



Children's Education	40	10
Agricultural Equipments	24	26
Shed & Other Construction	22	28
Purchases of Animals	21	29

Table No.2 reveals the pattern of expenses of milk income. Almost all the respondents utilized the milk income on the purchases of domestic items such as sugar, tea powder, soap, oil etc., while majority of the milk producers i.e. 80% are utilized the milk income for children's education. The 48 % respondent said that milk income was spent on purchases of agricultural equipments, while 44 % have spent their income on construction of cattle sheds, house etc. and 42% on addition of the animals. That means women are really helped by the dairy cooperative. The income received by them is spent on domestic activities, children's education and agricultural equipments etc.

### Impact of Dairy Cooperatives on Respondents

Empowerment of members and Success of any organization is assessed by analyzing favorable impact of such organization on members and the impact is assessed by various factors such as improvement in social status, economic condition, asset and knowledge of the members etc. In the same manner empowerment of women through dairy co-operative is judged by using such parameters. The researcher has made attempt to understand the impact of women dairy co-operatives on women.

**TableNo.3**

#### Statement showing Social and economic impact of dairy co-operatives

Impact	No of Respondents	%
Improvement in social status	37	74
Improvement in Economic Condition	41	82
Improvement in Quality of Food, Milch Animals etc.	33	66
Knowledge Increased	14	28
Asset Increased	16	32

It is evident from the above table that, maximum number of sample households (82%) agreed that their economic condition improved due to dairy co-operatives followed by improvement in social status (74%), availability good quality feed and improved milch animals (66%). The 32% respondents expressed their views that their asset is increased because of co-operative dairy societies where as 28% households pointed out that their knowledge relating to dairy industry is improved.

From the above discussion it is clear that the more power concentrated in the hands of women i.e. women are empowered.

### Problem Faced by Sample Respondents

Dairy business played an important role in rural economy by providing regular income throughout the year. The performance of the dairying is basically dependent on adequate financial support, improved breed, health care centers and balanced feeding knowledge of dairying and scientific management. Lack of one or other directly affects the dairying. From this point of view researcher has been made to study the problem faced by respondents. The results are given in the table no.4

**Table No 4**

#### Statement showing problems faced by women in dairy co-operatives

Particular	No of respondents	%
<b>FINANCIAL</b>		
1.Non availability of loan	41	82
2.Feed & Fodder cost	39	78

3.AI Costing	38	76
4.other	20	40
<b>FEED &amp; FODDER</b>		
1.Non availability of green fodder	20	40
2. Non availability of seeds	31	62
3.Lack of common grazing land	46	92
<b>BREEDING</b>		
1.Distance of AI centres	10	20
2.lack of knowledge about heat cycle	39	78
3.Non availability of veterinarians	11	22
<b>MARKETING</b>		
1.Irregular payment	05	10
2.Un-remunerative price	11	22
3.Irregular testing of milk	18	36
4.spoilage of milk	10	20

The above table shows that, majority of the respondents are faced the financial and breeding problem followed by feeding and marketing. On an average 82% of the respondents faced the problem of non availability of loan, high cost of feed (78%) , cost of AI (76%), while 92% of the respondents faced the problem of lack of common grazing land followed by non availability of seeds (62%).

As of breeding, lack of knowledge about heat cycle (78%) and non availability of veterinarians (20%) are major problem faced by respondents. As of marketing, irregular testing of milk (36%) , un-remunerative price (22%) are the problems faced ,while problem of irregular payment of milk bill faced by just 10%.

#### **V. Conclusion & suggestions:**

Majority of sample households derived income from animal husbandry (57%) followed by agriculture (28%).The expenditure pattern shows that the women in the study area expended maximum share of income children's education (80%) next to domestic needs (100%). Women expressed their views regarding impact of dairy co-operatives that, the economic condition and social status is improved as well as asset and knowledge is also increased. This is the sign of empowerment of women because of dairy co-operatives.

Apart from this women faced number of problems relating to finance, feed and fodder, marketing of the milk and breeding facilities of milch animals. Particularly non availability of loan and common grazing land, lack of knowledge of heat cycle of animal and irregular testing of milk are the major problems faced by women.

The study suggested provisions for two milch animals instead of one, regular testing of milk and remunerative price for milk, adequate financial support for purchasing milch animals, improved feed and health care, insurance. It is also suggested that special training programmes are arranged for women to create awareness among them and improved dairy practices.

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## Approaches of Rural Development in India

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### Abstract

*In the Indian context rural development assumes greater significance as near about (68.84%) per cent (according to the 2011 census) of its population still live in rural areas. Most of the people living in rural areas draw their livelihood from agriculture and allied sectors (61.5% of total work force), and poverty mostly persists here (27.1 % in 1999-2000). At the time of independence around 83 per cent of the Indian populations were living in rural areas. Accordingly, from the very beginning, our planned strategy emphasized rural development and will continue to do so in future. Rural development is a multifaceted phenomenon. So there are many approaches of rural development.*

Key Words : Approaches, rural development, Indicators.

### Introduction:

There are no universally accepted approaches to rural development. It is a choice influenced by time, space and culture. The term rural development connotes overall development of rural areas to improve the quality of life of rural people. In this sense, it is a comprehensive and multidimensional concept, and encompasses the development of agriculture and allied activities, village and cottage industries and crafts, socio-economic infrastructure, community services and facilities and, above all, human resources in rural areas. As a phenomenon, rural development is the end-result of interactions between various physical, technological, economic, social, cultural and institutional factors. As a strategy, it is designed to improve the economic and social well-being of a specific group of people – the rural poor. As a discipline, it is multi-disciplinary in nature, representing an intersection of agriculture, social, behavioural, engineering and management sciences. (Katar Singh 1999).

In the Indian context rural development assumes greater significance as near about (68.84%) per cent (according to the 2011 census) of its population still live in rural areas. Most of the people living in rural areas draw their livelihood from agriculture and allied sectors (61.5% of total work force), and poverty mostly persists here (27.1 % in 1999-2000). At the time of independence around 83 per cent of the Indian populations were living in rural areas. Accordingly, from the very beginning, our planned strategy emphasized rural development and will continue to do so in future. Strategically, the focus of our planning was to improve the economic and social conditions of the underprivileged sections of rural society. Thus, economic growth with social justice became the proclaimed objective of the planning process under rural development. It began with an emphasis on agricultural production and consequently expanded to promote productive employment opportunities for rural masses, especially the poor, by integrating production, infrastructure, human resource and institutional development measures.

### Meaning of Rural Development:

Rural development is a multifaceted phenomenon. As a result, there is a host of definitions of which none is universally acceptable. It is, however, argued that regardless of the conflicting views about development, there exists a wide consensus that people are at the center of all development process (Okore, 1992). Thus, there has to be a positive and qualitative change in the economic, socio-political and cultural lives of the people for development to be said to have taken place. The central idea of development as summarized by Sen (1999), is the enhancement of individual's abilities to shape their own lives. Madhu (2000) defines rural development as activities concerned with improvement of spatial and socio-economic environment of rural areas so as to enhance the ability of the individuals to cater to and sustain their well being.

### Indicators of Rural Development:

Asian Centre for Development Administration (ACDA, 2004) identified the following indicators of rural development,

- Increase in agricultural productivity,
- Increase in rural employment,
- Equitable distribution of wealth and income,

- Fair distribution of power and influence and participation in decision making,
- Removal of social barriers to have access to public facilities,
- Welfare indicators such as levels in literacy, schooling, mortality rate, life expectancy, rural roads, electrification and level of nutrition, and
- Change in the values, beliefs and attitudes of people.

### Objectives of Rural Development:

The specific objectives of rural development are:

- Raising the standard of living of people in rural areas,
- Alleviating poverty in rural areas and improving the quality of life of the people,
- Development of both farming and non-farming activities so as to generate gainful employment,
- Changing the attitudes of the rural people towards transformation of village community,
- Provision of social infrastructure such as drinking water, health-care, education, sanitation, housing, road, electrification, etc, and
- Maximum utilisation of local resources without adversely affecting the environment.

### Approaches to Rural Development

1. Multipurpose Approach
2. Broad front Approach:
3. Sectoral Approach:
4. Participatory Approach:
5. Area Development Approach:
6. Target Group Approach:
7. Basic Needs Approach:
8. Employment-oriented Integrated Approach to Rural Development:
9. Integrated Development Approach:
10. Growth Center Approach:
11. Community-driven development (CDD) or Approach:
12. Gandhian Approach and its current relevance:

#### 1. Multi-purpose Approach:

In early fifties, rural development efforts began with multi-purpose approach which included activities related to agriculture, animal husbandry, co-operation, irrigation, village and small scale industries, health, sanitation, housing, transport and communication, welfare of women and rural employment. The Community Development Programmes (CDP) and National Extension Service (NES) initiated in 1952 fell under this approach. Though CDP, as a holistic approach, did not succeed as expected. The impact of programme was ephemeral. It was said that the community development programme has been like film of butter spread over a large loaf, thus provide ineffective in a complex society. Hence, it could not make a dent into social fabric as was expected.

#### 2. Broad Front Approach:

Community Development and Panchayat Raj were often described as **\*Broad-front' or 'Multipronged\*** development strategies as they aimed at development of villages covering all the major spheres like Agriculture, Animal Husbandry, Rural Industries, Communication, Health, Education, Women Welfare and Social Welfare(Desai, 1983). In the early 1960's India revised its rural development strategy and adopted sectoral approach of development, due to financial limitations and pressing needs and priorities (Sharma, 1977)\* In the process, it launched specific sectoral development programmes such as Intensive Agricultural District Programme, Intensive Agricultural Area Programme, Intensive Cattle Development Programme, etc.

#### 3. Sectoral Approach:

Sectoral development planning in individual sectors like education, health, housing and social security are included in sectoral approach of development. This approach advocates compartmentalization of development in different sectors as if these are watertight compartments and have nothing to do with each other. Its inadequacies stem from this compartmentalized approach. Little attempts are to be made to integrate them. By 1960's the situation was rather critical on the food front. The need for great concentration on food production led to strategy for locating potential sectors and wellendowed districts and areas capable of yielding higher agricultural production. More attention was paid in improving productivity per acre than on

extending the acreage. Thus, the Intensive Agriculture Development Programme (1960) (IADP) and later in 1963 intensive Agricultural Area Programme (IAAP) were launched. Both IADP and IAAP constituted landmarks in the development of agriculture, indeed of the rural sector in India. The programmes placed agriculture on a qualitatively different footing with wide ranging repercussions on rural scenario. The programmes resulted in a spectacular breakthrough in total agricultural production and productivity per hectare but at the expense of social equality and social justice.

#### 4. Participatory Approach:

This concept has been developed from participatory development. "Participatory development is a process through which stakeholders can influence and share control over development initiatives, and over the decisions and resources that affect themselves" (ADB, 1996).

#### Types of Participation:

##### Passive Participation

People are told what is going to happen or has already happened. Top down, information shared belongs only to external professionals. Information giving People answer questions posed by extractive researchers, using surveys etc. People not able to influence the research. Consultation People are consulted and external agents listen to their views. Usually externally defined problems and solutions. People not really involved in decision making. Participation by material incentives Provision of resources, e.g. labor. Little incentive to participate, for example farm research, some community forestry.

##### Functional Participation

Groups are formed to meet predetermined objectives. Usually done after major project decisions are made, therefore initially dependent on outsiders but may become self dependent and enabling. Interactive Participation Joint analysis to joint actions. Possible use of new local institutions or strengthening existing ones. Enabling and empowering so people have a stake in maintaining structures or practices. Self-Mobilization already empowered, take decisions independently of external institutions. May or may not challenge existing inequitable distributions of wealth and power. Participatory Rural Appraisal (PRA) and Rapid Rural Appraisal (RRA) To enable people so that they can express and analyze the realities of their lives and conditions, to plan themselves what actions to take, and to monitor and evaluate the results. The difference is that PRA emphasizes processes that empower local people, whereas RRA

is mainly seen as a means for outsiders to gather information (Chambers and Blackburn, 1996)

#### 5. Area Development Approach:

This approach contemplates that development of an area depends not only on the development of an adequate infrastructure network but also the way factors of the local economy are activated around the production infrastructure. In other words, for development of an area, spatial and functional integration is necessary. Thus, while rural growth centers provide ideal locations for the provision of infrastructural facilities, their hinterlands are regarded as basic planning units for integrated multi-sectoral planning to achieve integrated development of an area. The approach, while taking area poverty into consideration, provides a balance between various sectoral activities as well as spatial pattern of growth; however, it does not ensure that economic growth is being shared by all classes and communities of the rural areas.

#### 6. Target Group Approach:

In order to accommodate the lagging sectors/regions rural development was re-conceptualized to highlight the improvement of the social and economic life of a specialized group of people. The target group comprised of marginal and small farmers, landless agricultural labourers for whom special programmes such as Small Farmer Development Agency (SFDA) and Marginal Farmers Development Agency (MFALDA) were started. It was noticed that the target group approach showed a better results where information facilities were satisfactory and administrative and organizational arrangements were reasonably strong. This approach was for the correction of regional imbalance. In this connection, mention may be made of Tribal Area Development Programme (TADP, 1972), Hill Area Development Programme (HADP, 1974-75), Drought Prone Area Programme (DPAP, 1970), Desert Development Programme (DDP, 1977-78), and Command Area Development Programme (CADP, 1975). These programmes were fairly successful in terms of implementation.



### 7. Basic Needs Approach:

The basic needs approach gives primacy to the need for a minimum standard of living of the poor as a central concern of development planning. It therefore contributes to the formulation of a development strategy, which aims at reducing poverty and inequality, promoting growth of employment and distributive justice. The basic needs concept is a wider scope covering personal and social consumption and also human rights, people's participation, employment and growth with justice. 48 The Minimum Needs Programme (MNP) in India was introduced in 1974 during the first year of fifth plan period. The fifth plan proposed MNP with the objectives of establishing network of basic services and facilities of social consumption in all areas of upto nationally accepted norms within in a specified time frame. It is essentially a programme of investment in human resources development and seeks to improve the consumption of those living below poverty line and thereby improving productive efficiency of people and their quality of life. The main components of MNP are: (1) Rural health, (2) Rural education, (3) Rural roads, (4) Rural drinking water, (5) Rural electrification, (6) House sites for landless, (7) Environmental improvement in slums, and (8) Nutrition.

### 8. Employment-oriented Integrated Approach to Rural Development:

With a view to overcome the limitations of earlier approaches and to improve the quality of life of the poor living in the rural areas, a multilevel, multi-sector, with multisection concept of integrated rural 49 development was launched in 1978-79. The different programmes were brought under single umbrella of Integrated Rural Development Programme (IRDP). It aimed at ensuring accelerated welfare and development of the poorest of the poor based on Gandhian concept of Antyodaya. Several programmes for providing employment to rural poor, namely, rural works programme, rural employment guarantee programme, IRDP, Training Rural Youth for Self-Employment (TRYSEM), Development of Women and Children in Rural Areas (DWCRA) and Jawahar Rozgar Yojana (JRY) were introduced.

### 9. Integrated Development Approach:

In the context of problems in the area development approach to tackle the problems of rural poverty, a new strategy of development, i.e. the integrated development approach has been developed because the area development approach by and large failed to address the question of inequalities in the distribution of employment, incomes and assets. A mere geographical emphasis, as is the case with the area development approach, has been found to be inadequate in solving the problems. The Indian economy and social structure are characterized by widespread poverty, poor health conditions, illiteracy, exploitation, inequitable distribution of land and other assets and lack of infrastructure and public utilities (roads, communications etc). Clearly, this means that the problem requires an approach that will take into account all these factors in devising a comprehensive strategy to further rural development. The concept of "integrated rural development" came into vogue with the need for a multipurpose thrust to rural planning. It stresses that various facets of rural development, which have an impact on rural life, are interrelated and cannot be looked at in isolation. Thus, an integrated approach towards rural development is essential. The various dimensions of rural life---growth of agriculture and allied activities, rural industrialization, education, health, public works, poverty alleviation and rural employment programmes -- all form a part of an integrated approach to the problems of rural development.

### 10. Growth Center Approach:

It is most appropriate for planning integrated rural development. Based on the principle of "equal accessibility", this approach can bring all these facilities, services and local administration [panchayats] within easy reach of the population. The growth center should be equipped with all the required facilities such as:

1. Training center to impart practical training and build capacity to enhance productivity of agriculture and rural/cottage/agro-based industries
2. Mobile training-cum-demonstration unit to provide on the spot training, repair and maintenance, services for agricultural and industrial machineries
3. Marketing-cum-warehousing facilities that can provide safe storage and marketing of farm produce and cottage industries products
4. Forest and grass nursery to provide fruits, fuel, fodder and forest cover

5. Developmental school based on the “earning while learning principle” and oriented to develop a cadre of self-employed workers in the area of human, animal, plant and soil-health care and
6. Residential housing complex for workers in the project area.

### **11. Community-driven development (CDD) Approach:**

It is derived from community-based development (CBD), which is a developmental initiative that provides control of the development process, resources and decision making authority directly to community groups. The underlying assumption of CDD projects are that communities are the best judges of how their lives and livelihoods can be improved and, if provided with adequate resources and information, they can organize themselves to provide for their immediate needs. Moreover, CDD programmes are motivated by their trust in people (Naidoo and Finn, 2001) and hence it advocates people changing their own environment as a powerful force for development. By treating poor people as assets and partners in the development process, previous studies have shown that CDD is responsive to local demands, inclusive, and more cost-effective compared to centrally-led NGO-based programmes. CDD can also be supported by strengthening and financing community groups, facilitating community access to information, and promoting an enabling environment through policy and institutional reform.

### **12. Gandhian Approach and its current relevance:**

Gandhiji's approach to India's rural development was holistic and people centered. The Gandhian model of rural development is based on some values and premises as follows:

- 1) Real India is found not in cities but in its villages.
- 2) The revival of villages is possible only when the exploitation of villages is stopped. Exploitation of villages by city dwellers was “violence” in Gandhiji's opinion.
- 3) Simple living and high thinking implying voluntary reduction of materialistic wants and pursuit of moral and spiritual principles of life.
- 4) Dignity of labour, everyone must earn his bread by physical labour and one who labours must necessarily get his subsistence.
- 5) Preference to the use of indigenous (Swadeshi) products, services and institutions.
- 6) Balance between the ends and means. From the above analysis it becomes clear that, there is no universally valid theory of rural development. However, the various paradigms and hypothesis of development reviewed provide many valuable insights into the processes and determinants of rural development.

### **Conclusion:**

There are no universally accepted approaches to rural development. It is a choice influenced by time, space and culture. The term rural development connotes overall development of rural areas to improve the quality of life of rural people. In this sense, it is a comprehensive and multidimensional concept, and encompasses the development of agriculture and allied activities, village and cottage industries and crafts, socioeconomic infrastructure, community services and facilities and, above all, human resources in rural areas. So, there are various types of approaches to rural development like Sectoral Approach, Area Development Approach, Integrated Development Approach, Growth Center Approach and Community-driven development (CDD) or Approach.

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## Role Of Ngos In Rural Development

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### **Introduction:**

Vast majority of India's poorest people are located in rural areas. The core problem of widespread poverty, growing inequality, rapid growth of population, growing and rising and unemployment all find their origins in the stagnation and other retrogression of economic life in rural areas. Most social and economic indicators consistently show that rural level that problems of hunger, ignorance, and ill-health and high mortality are most acute.

Therefore, if development is to take place and become self-sustaining, it will have to be rooted in and started from the rural areas. Development of rural areas has been at the core of the planning process in the country. Rural development is a broad and inclusive term, which takes I its ambit socio-economic development of rural areas. The basic objectives of rural development programme have been alleviation of poverty and unemployment through creating basic social and economic infrastructure, training to rural unemployed youth and to provide employment to marginal to marginal farmers/laborers, so as to discourage seasonal and permanent migration to urban areas. Rural development also includes strengthening the democratic fabric of society through local level government/institutions as well as provide the vast rural multitude 'voice and choice' apart from measures to improve income of rural household's and delivery systems pertaining to education, health and safety net mechanisms. Poverty alleviation is a key component of rural development.

### **Meaning of Rural Development:**

Rural development is a multifaceted phenomenon. As a result, there is a host of definitions of which none is universally acceptable. It is, however, argued that regardless of the conflicting views about development process (Okore 1992). Thus, there has to be a positive and qualitative change in the economic, socio-political and cultural lives of the people for development to have taken place.

World Bank (1975) defined rural development as implying the improvement in the living standard of masses of low income population residing in rural areas and making the process of development self-sustaining.

The central idea of development as summarized by Sen (1999), is the enhancement of individual's abilities to shape their own lives. Madhu (2000) defines rural development as activities concerned with improvement of spatial and socio-economic environment of rural areas so as to enhance the ability of the individuals to cater to and sustain their well being.

### **Objective of Rural Development:**

- Raising the standard of living of people in rural areas.
- Alleviating poverty in rural areas and improving the quality of life of the people.
- Development of both farming and non-farming activities so as to generate gainful employment.
- Changing the attitudes of the rural people towards transformation of village community.
- Provision of social infrastructure such as drinking water, health-care, education, sanitation, housing, road, electrification etc. and
- Maximum utilization of local resources without adversely affecting the environment.

United Nations (1996) made the following suggestions for the successful implementation of rural development programmes.

1. Adopt institutional arrangements that promote collaboration and co-operation among key agencies and interests; build consensus, educate the public through community level campaign and mobilize local resources.
2. Adopt the concept of "think globally, act locally".
3. Emphasize the role the partnership agreement – strengthening business and industry involvement and accountability.
4. Promote public participation in the planning and decision-making process with special reference to women and community based organizations.
5. Facilitate information dissemination, education, etc.

### Approaches to Rural development in India:

Since 1951 to till today, various approaches have been adopted by the Union Government to find a suitable strategy towards the achievement of rural prosperity, equality and employment of rural people. Table 1.1 gives the information regarding approaches of rural development in India.

**Table -1.1**

#### Approaches to Rural development in India

Sr. No.	Approach	Emphasis	Programmes
1	Multi-purpose approach	All round development of villages based on self-help & self-reliance	Community development programme (1952)
2	Sectoral approach	Intensive development of selected sectors namely, age/culture with concentration in area of comparative advantage.	Intensive Agricultural District Programme (IADP)(1960)
3	Target approach	Growth with social justice for promotion of weaker section of rural area.	Small Farmers Development Agency (SFDA), Marginal Farmers Development Agency(MFDA),Antyodaya(1971)
4	Area development approach	Spatial planning the reduction of regional imbalance	Command Area Development Programme(MMP) (1974)
5	Basic needs approach	Equalization of social consumption.	Minimum needs programme(MNP)(1972)
6	Employment oriented integrated rural development	Removal of un-employment, poverty through sectoral and area integration.	Integrated rural development programme TRYSRM(1979)DWCRA,JawaharRozagarYojana ,(1989)IndraAwasYojana, Employment Assurance Scheme, SGSY,(1985) DDP, DPAP, (1970) National Rural Employment Assurance (2006)

*Source: Based on Lalith N. 2004.*

### Role of NGOs in Rural Development:

Currently with the emphasis on people's participation the LLIs have emerged as a third sector in the country next to the government and the corporate sectors. During 1990, there was mushroom growth of NGOs. Most of them with rural focus are actively working. With failure of state I reaching the poor and marginalized, NGOs in India have come to play a very important role. As the part of civil society, the NGOs role in micro-macro linkage and policy advocacy have become a dominant feature now.

The role of the third sector assumes special significance. Substantial priority is given to NGOs in National Health Policy (1982), Seventh Five Year Plan, (1985-90), World Development Report (1993), National Population policy (2000) and so on. They are preferred as the decision makers.

In spite of multi-faceted nature of NGOs they are not similar in size, finds, nature of activity, and the ideological affinity. The only similarity of many of the organizations, they serve the people, down-trodden, economically weaker sections of the society.

Presently, the role of NGOs is very much a challenging one. In current scenario of the 21st century as observed by Edwin Cheria, (1999) the NGOs face dual task of collaborating critically with the state and at the same time fighting against the anti-people, anti-marginalized policy. NGOs sustained and the local resource mobilization.

In the era of globalization the NGOs of 21st century need to function as sensitive, critical and intellectual organization to protect the interest of the poor and with the 73<sup>rd</sup> Constitutional Amendment on Panchayat Raj Institutions (PRIs). New opportunities and challenges are opened up at the educate and enable the poor to enter into the local level governance with proper education, training and strategies. It is possible for the enlightened poor women and men to not only enter these bodies democratically but also give new dynamism to the bottom of development process. Strengthening of these grass-root democratic bodies will have a cumulative effect on the policy of the country.

The NGOs over the years have promoted vast social infrastructure of the poor, the women, and the dalits. The Hulme and Edward, 1095).

The voluntary organizational models and methods are credited with using innovation in experimentation and providing entry points for radical work. Their contribution in development, particularly, in the third world context is cherished and stress debated (Sundaram, 1986).

### **Conclusion:**

Findings of the study reveal that there is no comprehensive integrated national policy for rural development. And rural development is multifaceted in nature, the most suitable or theory of rural development is Gandhian Model with pre supposes the holistic approach and people center approach, local level institutions also advocates, the similar ideology to achieve rural development with people's participation.

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## Development of livelihood and Socio-economic status of marginal and deprived community through Sustainable Agricultural practices: A Case Study

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### Abstract:

*The present project work was conducted in Marathwada region of Maharashtra. In which project covers four districts viz., Beed, Parbhani, Latur, and Osmanabad. This project was implemented in 24 villages across 8 Blocks of 4 districts of Marathwada region. The present work reveals the story of small farmers who have socio economically deprived from long time. The purpose of the present project work was to uplift the socio- economic status of marginalized and deprived community by livelihood promotion and development of sustainable agriculture. At the end of the project work it was observed that occupants/dependents from 24 villages become independent and developed their own credit in the society.*

**Keywords:** Grazing land, landless community, organic input, training & socio-economic status.

### Introduction:

All landless people in Maharashtra, especially the marginalized communities have no access and control over natural resources, especially grazing land, to ensure sustainable livelihood, social dignity and enhanced role in decision making processes that affect their lives. The present project work is a part of the efforts of local NGO, an organisation has been working with marginalized and deprived communities in the Marathwada region of Maharashtra, on various developmental issues to improve their livelihood prospects. For the intervention and implementation of project 24 villages were selected from four districts and eight blocks. A core team of 14 persons was selected for the said project. Before actual work begins a baseline Survey was made to assess the ground reality of landless farmer community in the project area. It is helpful in implementation of project activities to recognize proper methods and to plan strategy accordingly.

On this basis of a detailed baseline survey format was prepared and study was conducted in villages to collect the information on socio economic status, existing knowledge, attitude and practices with regard to agriculture among gairandharaks of 24 selected villages. The baseline data reveals about their income sources other than agriculture, status of their livelihood, source and causes of debit, causes of their sickness, status of child and women education in the village, socioeconomic status of gairandharaks in the village, relation of gairandharaks with the upper caste people etc. Socio-economic status is the position which the individual farmer occupies with reference to the prevailing average standards, material possession, social participation and other factors (Trivedi, 1963). In baseline survey it is observed severe malnutrition among the children and women. In majority of the villages, bullock pairs, cows and farm implements are not available. Gairandharaks are made to be dependent on upper caste people for bullock pair and farm implements. The villages are devoid of the irrigation sources. Farmers expressed that they cannot afford chemical farming since it is expensive, harmful, require more inputs and maintenance and so interested in low input and cheaper organic farming. Lacking vegetables, fruits and milk products in their diet, so due to lack of nutrition, there is increase in sickness. Therefore it was necessary to intrude a project for developing the livelihood and uplifting their socio-economic status of landless farmers (gairandharak) among selected 24 villages. The project works begins with following objectives and practices method adopted.

### Project Objective

- Build capacities of occupants/dependents of grazing lands to adopt and follow sustainable agricultural practices with low input.
- Awareness building and dissemination of SAP amongst gairandharaks in larger number of villages.
- To understand and identify the socio-economic status of the selected small farmer in four Districts.

### Methodology used:

Mobilize, motivate, organize and educate the landless families to work collectively towards achieving the Project objectives. Facilitate the process of legalization for land entitlement for grazing land occupants. Provide technical training of Agro inputs to occupants of grazing lands and marginal farmers for efficient and sustainable use of natural resources with special emphasis on organic farming. Human resource development at local level. Effective demonstration of SAP in pilot villages (24 villages). Dissemination of SAP amongst larger number of villages. Networking and liaising with other organizations, networks and movements. Mass level Awareness among farmers on SAP & climate change. Mobilization & networking of aware farmers. Advocacy with government about water distribution, land legalization, cropping pattern & subsidies. Waste land development for livelihood process. Forestation, water & soil conservation.

### Project Activity:

Capacity building of In-House SAP core Team. Training of 24 Lead Families. Educating & motivating 992 occupants/dependents. Providing Bullock pairs & Farm implements in 24 villages. As farmers have no any other income source. Develop demonstration plot in selected 24 villages. Construction of Land husbandry structures on grazing land. Continuous field support, guidance & follow up by the team leader & coordinator. Development of 8 Field Resource Center (FRC) in 8 Block (2 each districts). Development of Farmers Information Center (FIC) in 24 villages. Organizing mass media campaigns. Organizing farmer's conventions at block level. Develop kitchen garden & plantation in selected villages. Formation of organic farmers club at village level.

### Development of In-house Team & Capacity building of gairandharak

- Capacity building of In-House SAP core Team(14 people).
- Training of 24 Lead Families.
- Capacity building of 992 families of grazing land. Occupants/Dependants through meeting, exposure, and training& on field support.



### Agricultural Implements & Assets:

- Farm implements such as mould plough, sprayer pump, sowing & harvesting implements, Bullock pair etc. was provided to gairandharaks in 24 villages.





**Construction of dug well & land husbandry structures:**

- ❑ Provided 1 dug well each in 8 block for irrigation & other purposes.
- ❑ Water & soil conservation activity has been completed on 515 acres of land in 4 districts.



**Situation before Program:**

Gairandharaks were facing the problem of wealth, health & hygiene. Gairandharaks usually goes for labor work on daily wages, which is not enough to improve their livelihood. The families with very few earning members may not able to get the required facilities (Dorairaj, 2006).

There is a major problem of migration for employment. Gairandharaks were dependant for work. They did not have any kind of proper knowledge, education about farming. They also did not have bullock & other farm implements for cultivation. Gairandharaks were unsecured about food & work.



### Impact of Program:

Gairandharaks cultivating their own land by using different organic inputs. Waste land converted into fertile land. Gairandharaks cultivating harmless organic food for community. They become independent & secured for food, work & economy. This might help in narrowing down the gap that may create among the different sections of the society (Umashankar, 2004).

Better nutritional status and health of grazing land occupants. Better mobilisation and use of community resources. Increased self reliance and reduced indebtedness. Improve soil quality & crop yield. Reduced migration of labour workers. Increased food security of dependant. Increased productivity of grazing lands. Organic farming gives Rural Self Sufficiency.



### Conclusion:

From the above finding it is observed that organic farming requires less money and external inputs and is more reliable farming practice. It requires only natural and human resources. Farmers need not to rely on the expensive external inputs which may attract to farmers in debt forever. Now farmers are independent and living with raised standard and credit in society.

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## Role of Dairy Activity in Rural Development of Upper –East Krishna Alley of Maharashtra

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### Introduction :-

Agriculture is backbone of the Indian economy. In India, agriculture is a source of livelihood. According to 2011 census, 68 percent of Indian population is engaged in agricultural activity. It has been the source of supply of raw materials to our leading industries, but agriculture is known as gamble in the hands of monsoon due to inadequate and irregular rainfall. Indian farming is becoming uneconomic due to the heavy pressure of population. Therefore, people cannot get adequate income. Hence they could not solve their economic problems. In this situation, agriculture should be supplemented with the subsidiary occupation such as dairy, poultry, sheep rearing, cattle breeding etc.. In these activities, dairy is leading activity and plays a vital role in the rural economy. It provides employment opportunities to the people and helps to change the socio – economic status of rural people.

### Objectives :-

1. To study the dairy activity and rural development in the study region.
2. To study the changing pattern of milk collection in the region.

### The Study Region :-

The Upper – East Krishna Valley is situated in the southern part of Maharashtra and is a part of Deccan plateau. The rainfall decreases from west to east. The eastern part of the study region is drought prone region and central part is cultivable area.

The study region consists of eight tahsils namely Khatav of Satara District, Khanapur, Tasgaon, Kadegaon, Miraj, Jat , Kavate Mahankal and Palus in Sangli District. It includes 453 villages. The region is drained by Krishna and its tributaries as Yerala and Agrani.

### Location :-

The Upper – East Krishna Valley lies between 16<sup>o</sup> 55<sup>o</sup> to 17<sup>o</sup> 28<sup>o</sup> N latitudes and 74<sup>o</sup> 21<sup>o</sup> to 75<sup>o</sup> 15<sup>o</sup> E longitudes. The study region has an average height of about 600 m. from mean sea level. The geographical area of the region is 5284 sq. kms and populated by 16.68 lakh persons.

The region is bordered to the north by Phaltan taluka, to the north-west by Koregaon taluka, to the north – east by Man taluka of Satara district, to the east by Atpadi and Jat taluka of Sangli district and Malshiras taluka of Solapur district, to the south – east by Karnataka state and to the west the region is bordered by Walwa taluka of Sangli district.

### Database and Methodology :-

A geographical study is based on field work. The research work is based on both primary and secondary sources of data. The primary data has been collected through field work and secondary data is collected from District Census Handbook, animal census and books. The period 2001-02 to 2011-12 is selected for the study of milk societies and dudh sangh and the period 2002 to 2012 have been considered for the milch animals. Data and information were analysed by tables, graphs, percentage etc.

**Table – 1 Tahsilwise number of dudh sangh and their annual milk collection in the study region**

Sr No.	Tahsil	No. of Dudh Sangh	Annual Milk Collection in 'lakh' litres					
			Cows	%	Buffaloes	%	Total	%
1	Khatav	05	145.63	10	36.59	3	182.22	7
2	Khanapur	01	15.51	1	71.17	7	86.68	3
3	Kadegaon	02	85.95	6	158.78	15	244.73	10
4	Tasgaon	02	136.46	9	155.86	15	292.32	11



5	Palus	01	NA	-	NA	-	NA	-
6	Miraj	15	788.49	53	500.43	47	1288.92	51
7	Kavathe Mahankal	03	93.00	6	58.83	5	9151.83	6
8	Jat	03	222.51	15	85.94	8	308.45	12
<b>Total</b>		<b>32</b>	<b>1487.55</b>	<b>100</b>	<b>1067.6</b>	<b>100</b>	<b>2555.15</b>	<b>100</b>
<b>Percentage</b>			<b>58.2</b>		<b>41.8</b>		<b>100</b>	

Source – Compiled by the researcher based on field work

The table indicates that the tahsilwise number of dudh sangh's and their annual milk collection in 2008-09. Here it is noted that the dudh sangh called as where milk has collecting from primary milk societies in the surrounding areas and processing by milk. It includes large as well as small dudh sanghs.

The table shows the highest number of dudh sanghs observed in Miraj tahsil as 47 per cent dudh sangh. In the region, out of 32 dudh sanghs, 15 dudh sangh observed in Miraj tahsil. That means Miraj has ranked first in number of dudh sangh as well as annual milk collection. Followed by Miraj the percentage of annual milk collection is in Khatav (15.6%), Kavathe Mahankal and Jat (9.4%), Kadegaon and Tasgaon (6.2%) and Khanapur and Palus tahsil (3.1%).

The table also reveals that the annual milk collection in the region. The highest milk collection is observed in Miraj tahsil. Out of total milk collection about 50 per cent milk collection in Miraj tahsil, followed by Jat (12%), Tasgaon (11%) and Kadegaon (10%) tahsil. The lowest percentage of milk collection observed in Khanapur tahsil as only 3 per cent. In the study region, cow's milk collection is more than buffaloes.

. In Miraj tahsil the highest annual milk collection of cows as well as buffaloes. In Palus tahsil, the data is not available because in this tahsil only one dudh sangh in private sector that is Chitale milk project which is not prepared the data. In Khatav and Jat tahsil, cows annual milk collection is more than buffalo, but tahsils of Khanapur, Tasgaon and Kavathe Mahankal, there is same group of (100-200) milk collection .

**Table - 2**  
**Employment Provided by Dudh Sangh in the study Region**

Sr. No.	Tahsil	No. of Dudh Sangh/ Dairies	Total No. of workers.	%	Monthly salary of total workers in lakh Rs.	%
1	Khatav	05	75	8.3	2.29	3.0
2	Khanapur	01	60	6.6	2.40	3.1
3	Kadegaon	02	68	7.5	1.98	2.5
4	Tasgaon	02	112	12.4	4.22	5.4
5	Palus	01	NA	-	NA	-
6	Miraj	15	478	52.7	63.22	81.5
7	Kavathe Mahankal	03	45	5.0	1.45	1.9
8	Jat	03	68	7.5	2.03	2.6
<b>Total</b>		<b>32</b>	<b>906</b>	<b>100</b>	<b>77.59</b>	<b>100</b>

Source: - Compiled by the researcher based on field work

The table reveals that the tahsilwise number of dudh sangh and number of workers whose work in dudh sangh and their percentage in the study region.

It is observed that there are 32 dudh sangh or dairies in the study region. It is provided employment opportunity to 906 peoples. The highest number of dudh sangh observed in Miraj tahsil (15) and they provided employment to 478 peoples. The highest percentage of workers and their salary is observed in Miraj tahsil that is 52.7 percent and 81.5 percent respectively, followed by Tasgaon (12.4% and 5.4%) and Khatav (8.3% and 3.0%) tahsil. The lowest number of workers worked in dudh sangh has observed in Kavathe Mahanakal tahsil that is only 5 percent. Thus dairy sector provided more employment opportunities and it helps the reduction of rural poverty.

**Table 3.17**

**Employment Provided by Primary Milk Societies in Sample Villages in the study region.**

Sr. No.	Tahsil	No. of milk Societies	Total No. of workers	%	Monthly Salary of total workers in Rs	%
1	Khatav	33	44	19.8	75100	21.1
2	Khanapur	24	40	18.0	57300	16.1
3	Kadegaon	26	35	15.8	60000	16.8
4	Tasgaon	36	46	20.7	80400	22.6
5	Palus	03	06	2.7	10400	2.9
6	Miraj	22	29	13.1	47600	13.4
7	Kavathe Mahankal	11	15	6.8	17700	5.0
8	Jat	07	07	3.1	7600	2.1
<b>Total</b>		<b>164</b>	<b>222</b>	<b>100</b>	<b>356100</b>	<b>100</b>

Source :- Compiled by the researcher based on field work

The table reveals that the total number of milk societies, number of workers whose work in these societies and their monthly salary in the 46 sample villages in the study region.

It is observed that there are 164 number of milk societies in 46 sample villages. It is seen that 222 total number of workers work in these societies, which monthly salary is found Rs 3.56 lakh per month. It helps them to increase the standard of living.

There are positive relation between milk societies and employment opportunities. The number of milk societies increased, the number of workers also increased. Thus, the dairy sector has to give more employment to the people in the study region.

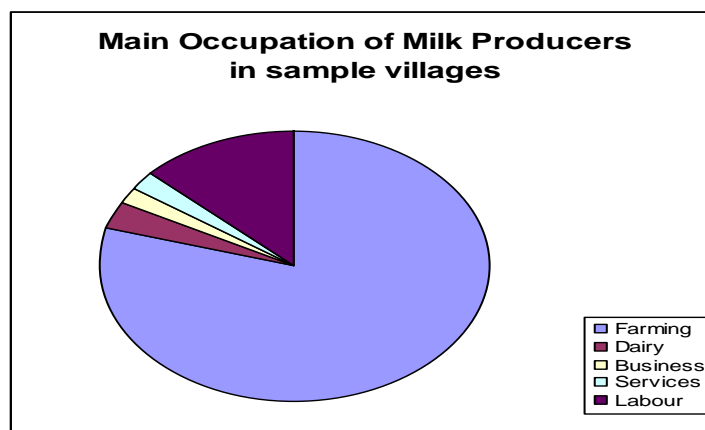
**Table No.3**

**Main Occupation Of Milk Producers**

Sr.No.	Occupation	Milk Producers	Percentage
1	Farming	762	79.5
2	Dairy	31	3.2
3	Business	20	2.1
4	Services	20	2.1
5	Labour	125	13.1
<b>Total</b>		<b>958</b>	<b>100</b>

Source :- Compiled by the researcher based on field work.

The table 3.12 reveals that the main occupation of milk producers in 46 sample villages in the study region. It is observed that the 79.5 per cent milk producer's main occupation is farming. The percentage of milk producers whose main occupation is dairy activity is 3.2 per cent and 2.1 per cent milk producers engaged in the tertiary sector that is business and services, which is their main occupation. Nearly 13.1 per cent milk producers main occupation is working as labourer. Most of these labourers keep 2-3 cows or buffaloes for dairy activity. They get green fodder and crop residues free of cost from the farmers for whom they work.



### Conclusion :-

1. Agriculture is main occupation and dairy activity is subsidiary occupation of the study region.
2. In Upper- East Krishna Valley , 32 dudh sanghs are collected the cows and buffaloes milk and chilling and pasteurized them.
3. Cows and buffaloes are main source of milk in the region. Annual milk collection was 2555.15 lakh liters in the region.
4. Dairy farming provided the employment opportunity to the farmers and hence increased the standard of living by peoples who engaged in dairy activity.

### Recommendation :-

1. Introduction of improved milch animals is necessary because of increase the milk production.
2. Farmers should be necessary to rethinking of HYV milch cattle in the region.
3. Peoples should change their attitude regarding dairy farming, they should produce milk by-products.
4. By constructing the gobar gas plants in the region, fuel problem can be minimized. Therefore, it is suggested that dudh sangh should be provided loan and maximum subsidy to them .

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## **Growth of Textile Industry in Kolhapur District –A Geographical Analysis**

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### **1. Introduction-**

Indian Textile mills contribution in the Indian economy, in terms of Industrial production, Exporting of Material, New employment generation, foreign investments and earning of foreign currency and so on. It contributes 20 percent of production, 20 percent of exporting, 18 percent of employment, 9 percent of excise collection and 4 percent of Gross Domestic Production (GDP).

Textiles have such an important bearing on our daily lives that means everyone needs of cloths to protect body from surrounding environment. There are three basic needs of humankind that are food, clothing and shelter. Out of them the clothing is related to the textile industry. Textile industry was around the humankind itself from ancient period. Before some centuries ago, human wear animal skin as a cloth. Cloths are giving protection from surrounding climate to human body. Some time human uses a grass as a cloth. After some decades later human uses sheep wool for creation of cloths. Then now a day's various types of materials are used to creation of cloths.

According to Dr. Piramal (1993) "The Textile industry plays as extremely vital role in the Indian economy, as it is the premier organized industry and contributes the highest net foreign exchange earning of the country. As a supplier of yarn to millions of handloom; powerlooms and hosiery units; textile units plays very crucial role in the textile economy."

The textile industry is second largest industry after the agriculture in terms of employment. Textile industry provides near about 35 million person's employment in India. The textile industry is well developed in India because currently India is third largest producer of cotton, second largest producer of silk, fifth largest producer of synthetic fiber and has the largest loom age and ring spindles in the world. (khullar 2011)

Kolhapur district comprising the valley of warana, Panchganga and their tributaries has been developed the fertile and producing soil. The traditional geographical location of the district between the Konkan costal low land to the west ocean, plateau to the east, presents a variety in the geographical environment (Sarang, S.B., 1982).Industrialization means Growth and Development of industry. Industrialization is helpful to change economic status of society. Industrialization process is started in India in the half of the nineteenth century.

### **2 The Study Region**

Kolhapur district is the southernmost district of Maharashtra State. Kolhapur district is one of the industrially developed also agriculturally developed district in Maharashtra. The Kolhapur city is situated on the bank of river "Panchaganga" and it is known as "Dakshin kashi". It is located at the foot of sahyadrian mountain range. Geographical set up of Kolhapur district is lies in between 15° 43' North to 17° 10' North latitude and 73° 40' East to 74° 42' East longitude. Kolhapur district is surrounded by in north sangli district, towards the south and east Belgaum district of Karnataka State, and the Ratnagiri and sindhudurg district to the west.

The total area of Kolhapur district is 7746 Sq.km. it covers 2.5% area of whole Maharashtra state. It ranks 24th in the state as far as area is concerned. Kolhapur district includes 12 Tahsils such as Aajra, Bhudargad, Chandgad, Gadhinglaj, Gaganbawda, Hatkanangale, Kagal, Karveer, Panhala, Radhanagri, Shahuwadi and Shirol.

### **3 Objectives**

1. To study the present situation of the textile mill in Kolhapur district.
2. To study the growth of spinning mills in Kolhapur district.

### **4 Database**

Primary data will be collected from intensive field work .The questionnaire will be used for the collection of relevant data from field work. Photography will be used for highlighting the intensity of impact. The sampling methods will be adopted for the present study. Secondary data is collected from the Directorate of handlooms and powerlooms co-operative textile, Government of Maharashtra. Indian Cotton Mill federation journal. Socio- economic Abstract of Kolhapur district. Maharashtra Industrial development co-operation (MIDC). Gazetteer of Kolhapur, District census handbook, Zilha parishad and other.

### 5 Methodology

The following methodology has been adopted for present study

1. The intensive method of interview has been adopted for the collection of primary data.
2. Collection of secondary data from the various offices of textile industry of Maharashtra.

### 6 Growth of textile industry in India

The Indian textile policy of 1985 and 1991 economic policies of India leads to economic growth of India. In 1990s textile sector growth is taken very fast. In 1987 textile mills are 744 and in 1997 it go up to 1438. Within 10 years textile mills are get double. In India textile mills are increase day by day. Now days, about 16 percent of industrial capital and 20 percent of labour of the country are engaged into the textile sector. In India  $\frac{3}{4}$  are spinning mills and  $\frac{1}{4}$  are composite mills.

### 7 Growth of textile Industry in Kolhapur:

Growth means a positive change of particular things in increasing manner; it simply means the increasing of specific factor in quantitative, growth is measurable in quantity. The industrial growth is part of economic growth and it's measured in GDP.

(S. Thorath 2014)Growth of textile industry in Kolhapur district is started in the period of industrialization by the Shahu Maharaj. The Shahu mahraj was establishing Shahu mill st the centre of Kolhapur city in 1906. From 1906 Kolhapur district textile growth was taken place. The Shahu Maharaj started spinning and weaving mill. He gave capital, land, water supply etc. to establish this mill. The mill total area is 27 acre in the heart of Kolhapur City. Ichalkaranji in Kolhapur District popularly has known as "Manchester" of Maharashtra. Shrimant Narayanrao Babasaheb Ghorpade was responsible for developing the Ichalkaranji village into an important Industrial town. He encouraged Mr. Vitthalrao Datar, a young entrepreneur of the town, to install a power loom in 1904. Perhaps this was the first power loom started in the decentralized sector in the country.

**Table no. 1.1**  
**Growth of textile mills in Kolhapur**

Group of Establishment year	Number of mills	Percent
1900-1920	01	2.70
1920-1940	--	--
1940-1960	01	2.70
1960-1980	07	18.92
1980-2000	16	43.24
2000-2017	12	32.43
Total	37	100

Source: field work (2016)

Above table no. 1.1 shows that growth of textile mill in Kolhapur district. In 1906 first textile mill was setup. After that textile growth will be taken place in Kolhapur district. In 1900-1920 period only one mill was established. In1940-1960 also another one mill is established. After 1960 various mills are established in Kolhapur district. 1962 deccan co-operative textile mill was established. In 1960-1980 there was 7 mills are established with the proportion is 18.92. After that 1980-2000 large amount of textile mills are established. This are 16 mill with the proportion is 43.24 percent. These mills are located near to Ichalkarnji. And early in the years 12 mills are established with the proportion 32.43 percent. These mills are located mainly five star MIDC Kagal. In the last 20 years various private mills are established in Kolhapur district like as Raymond, Monti, Oswal, Sudarshan Jeans, Suktas, Indo-Count etc. 1980-2000 years period shows highest growth of textile mill in Kolhapur district. And 1920-1940 years period shows the zero growth. And 1900-1920 and 1940-1960 shows the lowest growth rate of textile mills in Kolhapur district.

### 8 Mill Sector In Kolhapur District

**Table No.1.2**  
**Number Of Major Textile Mills In Kolhapur District**

Sr.no.	particulars	No. of textile mills
1	Under production	34
2	Work in progress	02
3	Newly registered	08
4	closed	02
5	Liquidation	02

Source – technical performance report of Maharashtra state co-operative textile federation



Above table shows the present condition of the major textile mills in Kolhapur district. From the table said that 34 mills are working condition there production is continuously goes on. 2 mill are under the construction, 8 mill are newly registered, 2 mills are closed this are Shahu mill and Dattajirao kadam mill, 2 mills are liquidation this are Janata mill and Deccan mill.

### 9. Constitution of textile mill

**Table No.1.3 Constitution Of Textile Mill**

Constitution	No. of Mills	Percent
Co-operative	19	48.71
Private	20	51.29
Total	39	

Source: Field work (2016)

Above table shows that constitution of textile mills are located in Kolhapur district. In district co-operative textile mills are 19 with the 48.71 percent. Out of them 3 mills are closed down due to some problems like lack of mechanization, sick industry, labour problem etc. and 2 mills work is in progress. In the district 20 textile mills are private mills with the 51.29 percent proportion. On that basis, says that private mills are greater than the co-operative mill. Some co-operative mills are closed down but no one private mill can't be closed down. Here private mills growth is very much faster than the co-operative mill.

### 10 Installed capacity of spindles in Kolhapur district

The information about the licensed and installed spindles in textile mills of Kolhapur district as follows

**Table no.1.4**

**Installed workable spindles Difference between 2006-12 in selected mills in Kolhapur district**

Name of the mill	2006-07	2011-12	Difference
Annabhau ajara	00	20304	20304
Choundeshwari Ichalkarnji	12480	12480	00
Datta shetakari Ichalkarnji	10507	9648	-859
Deshbhakat Jaysingpur	00	14352	14352
Hutatma mudal	00	13728	13728
Ichalkarnji	70738	50584	-20154
Indira mahila Ichalkarnji	25200	25200	00
Mahatma phule Peth vadgaon	13756	34272	20516
Nav Maharashtra sajani	25565	27216	1651

Above table no. 1.4 shows the difference between two years installed spindles in spinning mills. Mahatma phule Peth vadgaon and Nav Maharashtra sajani having a positive change. Those mill increased their capacity of installed spindles. There are 3 mills are started after 2006 therefore this mill having an only one year spindles number. Choundeshwari Ichalkarnji and Indira mahila Ichalkarnji mills having an no change their spindles are same both in the year. Ichalkarnji and Datta shetakari Ichalkarnji mills having a negative change. Those mills decreased their capacity of installed spindles.

### 11 Conclusion-

The textile mills in kolhapur district are thus facing both the short-term and long-term problems, high prices of raw material, availability of raw material, labour, liquidity and market problems. In kolhapur district growth of textile mill is increases continuously and their installation capacity of spindles is increases but Ichalkarnji mill and data shetakari mill are decreases installation capacity of spindles.

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## Social Development of Scheduled Caste Women's in Kolhapur District

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### Abstract:

*Scheduled Castes is among the most disadvantaged social group not only in India but also in the state of Maharashtra and in its Kolhapur district. Present study is based on the secondary data mainly collected from Census of India, 2011 it is attempted to measure the social development of women in Kolhapur district of Maharashtra state. For measuring the social development of women Kundu's method of normalization has been employed and comparative analysis has been done. In the study region Scheduled caste women population from Karvir and Hatkanangale tehsils has high levels development and hilly and remote tehsils likes Bavda, Radhanagari, Bhudargad and Chandgad tehsils has have not exposed to the modern way of living and their areas are still lagging much behind.*

**Key Words:** Scheduled Castes, Social Development.

### Introduction:

Women constitute nearly half of the total population of the society but their share in the fruits of development is abysmally low. The structural arrangement of the society provides women low position. They are economically exploited and discriminated, socially subjugated and politically rendered a powerless group in the society (Bhattacharya, 2014). Development is a multi-dimensional phenomenon. Some of its major dimensions like the level of economic growth, level of education, level of health services, degree of modernization, status of women, level of nutrition, quality of housing, distribution of goods and services, and access to communication (Das, 1999).

The unfortunate fact is that in many developing economies like India, despite growth and development, women are still not granted an equal status at the micro level of the household or at the macro level of community and society at large (Bhat and Sharma, 2006). The general well-being or position of women in the society may define the status of women. The position of women varies from caste to caste, religion to religion and region to region. It is generally seen that the women's status is low. Women have low status because of social and economic insecurity (Ramotra, 1997).

As we know Scheduled Castes is among the most disadvantaged socio-economic groups not only in India but also in the state of Maharashtra and in its Kolhapur district. In a traditional caste-ridden society of India, a person who has a low status in caste hierarchy also has low status in other hierarchies of social and economic development. It shows that there is a close relationship between the caste-based status and socio-economic status of population in a region (Ramotra, 2008). Thus, it is important to study social development of women belongs to Scheduled Castes communities.

### Objective:

The main objective of the present study is to measure the social development of women in Scheduled Castes in Kolhapur district of Maharashtra state.

### The Study Region

Kolhapur district is one of the western districts of Maharashtra state and it is a part of Deccan plateau. Geographically Kolhapur district lies in between 15°, 43' to 17°, 10' North latitude and 73°, 40' to 74°, 42' East longitude. It is surrounded by sangli district to the north, Karnataka state to the south and east, and the Ratnagiri and sindhudurg district to the west.

The total area of Kolhapur district is 8,059 Sq km, which covers 2.62% area of Maharashtra state. It includes twelve Tahsils such as Karveer, Kagal, Panhala, Shahuwadi, Hatkanangale, Shirol, Radhanagri, Bhudargad, Gadhinglaj, Gaganbawda, Aajra and Chandgad. The total population of the district is 3523162 where Scheduled castes population is

449641(12.76%) and in this (221518) 49.27 percent female population is recorded as per 2011 census.

### Database and Methodology

On the basis of availability of data, for the present study, four social indicators like general sex ratio, child sex ratio, literacy rate, and proportion of urban population, etc. are taken in to consideration separately to assess the social development of women concerning to Scheduled Caste at tehsil level, for the year 2011.

Composite index for measuring the status of women's belonging to S.C. of society have been computed by using Prof. Kundu's (1980) method of normalization. For that purpose each observation for each indicator have been divided by their corresponding mean values in order to remove the scale bias in the data without affecting relative positions of areal units in the series. Here we have made some modification and computed the mean of the mean of each indicator for 2011 and accordingly each observation of each indicator have been divided with their respective mean of the mean so as comparative analysis of women's status belonging to Scheduled Caste have been done for the year 2011. Lastly on the basis of composite index, women's status has been classified into four different suitable categories as follows.

1. Very High Level Status of Women (Above 7.00)
2. High Level Status of Women (5.00-7.00)
3. Moderate Level Status of Women (3.00-5.00)
4. Low Level Status of Women (Below 3.00)

### Result and Discussion:

#### 1. Status of Scheduled Caste Women:

There are many indicators available for analyzing social status. As per availability of scheduled caste data literacy rate, sex ratio, child sex ratio and proportion of urban population is assessed for analyzing social status of scheduled caste Women's in Kolhapur district.

In the study region S. C. Women's literacy rate is varying tehsil to tehsil. Hatkanangale (72.46 %), Shirol (70.36 %) and Karvir (74.20 %) tehsils has highest literacy rate whereas Bavda (55.03 %) and Chandgad (56.88 %) tehsils has lowest literacy rate and remaining tehsils has moderate S. C. Women's literacy rate. While considering sex ratio of S.C. population Shahuwadi, Bhudargad, Ajra, Gadhinglaj and Chandgad tehsils has high total sex ratio (above 1000) while remaining seven tehsils such as Panhala, Hatkanangle, Shirol, Karvir, Bavda, Radhanagari and Kagal are located in moderate sex ratio group (950 -999). In 2011 high sex ratio is found in Ajra tehsil while low sex ratio is observed in Hatkanangle tehsil.

**Table No.1: Social Status of Scheduled caste Women's Population in Kolhapur District (2011)**

Tehsil	Literacy Rate	Sex Ratio	Child Sex Ratio	Proportion of Urban S.C. Population
Shahuwadi	63.12	1021	947	6.71
Panhala	68.26	978	954	2.66
Hatkanangale	72.46	975	928	37.55
Shirol	70.36	990	952	12.85
Karvir	74.20	982	909	62.66
Bavda	55.03	977	1035	N.A.
Radhanagari	62.31	996	880	N.A.
Kagal	65.79	995	867	20.26
Bhudargad	62.82	1028	860	N.A.
Ajra	60.34	1076	944	10.21
Gadhinglaj	60.41	1040	930	14.25
Chandgad	56.88	1014	927	N.A.
<b>Kolhapur District</b>	<b>69.31</b>	<b>991</b>	<b>921</b>	<b>32.37</b>

Source: Kolhapur District Census Handbook: 2011

The child sex ratio is low as compare to total sex ratio of S.C. population. the district average is 921 girl child per 1000 boy child population. Bavda (1035) tehsil has highest child sex ratio in the study region whereas Bhudargad (860) tehsil has lowest child sex ratio.

Proportion of urban S.C. population is diversified in the study region. Four tehsils in the district has no urban population because absence of urban area. Highest proportion of urban S.C. population is observed in Karvir (62.66) tehsil followed by Hatkanangale (37.55) and Kagal (20.26) respectively. Panhala (2.66) tehsil has lowest proportion of urban S.C. population in the study region.

## 2. Levels of Social Development:

As per above discussed social indicators such as literacy rate, sex ratio, child sex ratio and proportion of urban population is assessed for analyzing levels of social development of scheduled caste Women's in Kolhapur district. Composite index for measuring the status of women's belonging to S.C. of society have been computed by using Prof. Kundu's (1980) method of normalization. on the basis of composite index, women's status has been classified into four different suitable categories as follows.

1. Very High Level Status of Women (Above 7.00)
2. High Level Status of Women (5.00-7.00)
3. Moderate Level Status of Women (3.00-5.00)
4. Low Level Status of Women (Below 3.00)

**Table No.2: Levels of Social Development of Scheduled caste Women's Population in Kolhapur District (2011)**

Tehsil	Literacy	Sex Ratio	Child Sex Ratio	Proportion of Urban S.C. Population	Composite Index
Shahuwadi	0.98	1.02	1.02	0.48	3.50
Panhala	1.06	0.97	1.03	0.19	3.25
Hatkanangale	1.13	0.97	1.00	2.70	5.79
Shirol	1.09	0.98	1.03	0.92	4.03
Karvir	1.15	0.98	0.98	4.50	7.61
Bavda	0.86	0.97	1.12	0.00	2.94
Radhanagari	0.97	0.99	0.95	0.00	2.91
Kagal	1.02	0.99	0.93	1.45	4.40
Bhudargad	0.98	1.02	0.93	0.00	2.93
Ajra	0.94	1.07	1.02	0.73	3.76
Gadhinglaj	0.94	1.03	1.00	1.02	4.00
Chandgad	0.88	1.01	1.00	0.00	2.89

*Source: Compiled by the Author*

### 1. Very High Level Development of S.C. Women (Above 7.00):

In the study region only Karvir tehsil has very high levels of development because this tehsil is highly urbanized as well as high education facilities are available therefore literacy rate and Proportion of Urban S.C. Population is very high as compare to other tehsils in the district.

### 2. High Level Development of S.C. Women (5.00-7.00):

In the study region Hatkanangale tehsil has high levels of development due to tehsil is urbanized as well as industrial developed therefore literacy rate, sex ratio and Proportion of Urban S.C. Population is high as compare to other tehsils in the district.

### 3. Moderate Level Development of S.C. Women (3.00-5.00):

In the Kolhapur district Shahuwadi, Panhala, Shirol, Kagal, Ajra and Gadhinglaj tehsils has moderate levels of development due to high fertile soil and irrigation facilities provides development in agriculture.

#### 4. Low Level Development of S.C. Women (Below 3.00):

Low Level Development of S.C. Women is observed in Bavda, Radhanagari, Bhudargad and Chandgad tehsils. Basically these tehsils are located in the hilly region therefore no urban population as well as less developed agriculture resulting on low levels of development.

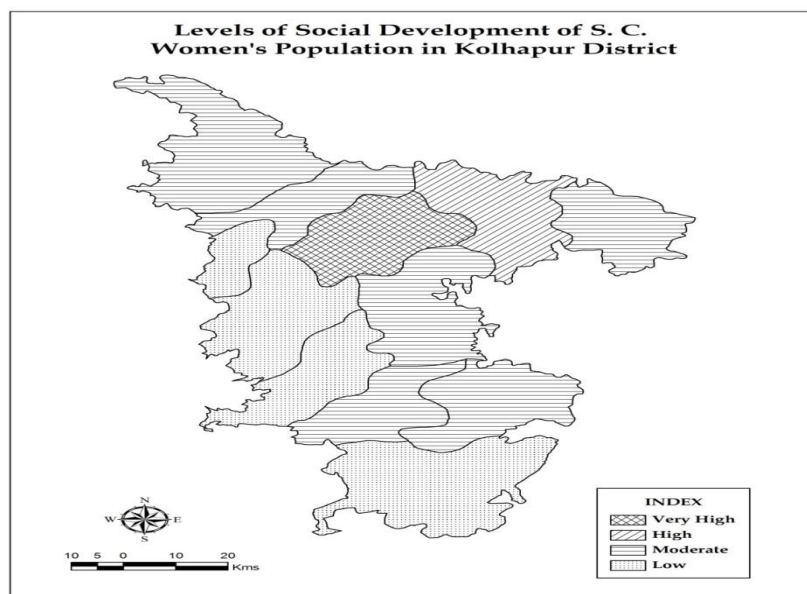
#### Conclusion:

The present paper concludes that the composite index value of social development of scheduled caste women shows that there is wide disparity in women's status within the study region in 2011. It is further found that mostly those tahsils, which are having higher level development of women belonging scheduled caste has high urbanized as well as industrial developed. Though there has been much of the improvement in various social dimensions like, education, urbanization, level of living, etc. In the study region Scheduled caste women population from Karvir and Hatkanangale tehsils has high levels development and hilly and remote tehsils likes Bavda, Radhanagari, Bhudargad and Chandgad tehsils has low levels of development.

Therefore, there is need to give special attention by the government, towards women's position of Scheduled caste from hilly region of the district, to improve their social condition and level of living by giving them equal opportunities in education and employment so far Scheduled caste women's status come up to the level of women's status of non Scheduled Castes class.

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## Landuse and Landuse Efficiency in Satara District: a Geographical Analysis

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### Abstract:

*Agricultural geography is a scientific study of the spatial pattern of agricultural activities in dimension of time and space. Landuse and landuse efficiency plays vital role in agricultural planning. Land used or utilized for various purposes by human is known as landuse. Landuse efficiency is a ratio between gross cropped area and net sown area in a component areal unit. The Satara district is one of the districts of the Maharashtra state and is located on the south. The present study is based on secondary data which is collected from disreict socio-economic abstract of Satara district. The study of land use pattern in the study region is classification of the land and grouped in to following four categories i.e. Forest Cover, Land not Available for Cultivation, Fallow Land and Area under Agriculture. Net sown area is quite significant in the study region basically riverside fertile plain region has more area under cultivation. Landuse efficiency is high in the tahsils such as Wai, Khandala, Satara and Karad because of well developed irrigation facility and fertile plain region with black soil.*

### Introduction:

Agricultural geography is a scientific study of the spatial pattern of agricultural activities in dimension of time and space. The term 'agriculture' is derived from the Latin word 'agercultura', which stems from two Latin words i.e. 'ager' meaning a field and 'cultura' meaning to culture or cultivate. In this sense agriculture means cultivation of field. The word 'geography' in its Greek derivation denotes a discussion of the earth. Thus, agricultural geography is the discussion of the cultivation of field on the earth's surface.

Landuse and landuse efficiency plays vital role in agricultural planning. Land used or utilized for various purposes by human is known as landuse. Landuse involves the management and modification of natural environment such as fields, pastures and settlement. UN Food and Agriculture Organization explains that " Landuse concerns the products or benefits obtained from use of land as well as the land management actions carried out by humans to produce those products and benefits".

Landuse efficiency is a ratio between gross cropped area and net sown area in a component areal unit. Efficiency of land drastically affects on landuse as well as cropping pattern, crop productivity. The study of landuse and efficiency is quite significant to develop solutions for natural resource management.

### Objectives:

This research paper deals with following specific objectives:-

1. To find out Landuse Pattern in the study area.
2. To assess landuse efficiency in Satara district.

### Location of Study Area:

The Satara district is one of the districts of the Maharashtra state and is located on the south. It lies between 17<sup>o</sup> 05' and 18<sup>o</sup> 11' north, latitude and 73<sup>o</sup> 33' and 74<sup>o</sup> 54' east longitude. It is bounded by Pune district on the north, solapur district on the east, Sangali district on the south and Ratnagiri and Raigarh district on the west.

The Study region covers an area of 10,484 km and has a population of 3,003,741 persons according to 2011 census. Administratively it consists of eleven talukas. Viz., Satara, Wai, Khandala, Koregaon, Phaltan, Man, Khatav, Kharad, Patan, jaoli and Mahabaleshwar. In the district there are 22 towns, 11 tahsils with 1745 villages. Satara is one of the least urbanized

district, having 19.0 percent of its population in urban areas whereas 45.2 percent of the state population lives in urban areas.

### Database and Methodology:

The present study is based on secondary data which is collected from disreict socio-economic abstract of Satara district. Landuse data for year 2015 is obtained socio-economic abstract of Satara district. Acquired secondary data is tabulated, processed and labeled with suitable cartographic techniques. The index of landuse efficiency is calculated by using the following formula-

$$\text{Index of landuse efficiency} = \frac{\text{Net sown area}}{\text{Gross cropped area}} \times 100$$

### Landuse Pattern:

Land use Pattern of an area is a cumulative outcome of the interaction between relief, climate, soil structure and socio-economic factors of that area. Land use studies are essential to avoid the abuse and for the optimum use of every piece of land without disturbing the ecological balance of the region.

The study of land use pattern in the study region covers proportion of area under different land use at a point of time. It is based on the census classification of the land and grouped in to following four categories.

The land use pattern of the study region is shown in Table No. 1, the geographical area of the study region is 1058243 hect. The proportion of area under agriculture is the 52.69 per cent to total geographical area of region.

Out of the total geographical area is 22.84 per cent area is under fallow land while 13 per cent of land is under Forest and 11.47 per cent land covered by settlements, industries and transportation network therefore it is not available for cultivation.

**Table No. 1: Satara District: Tahsil Wise Land Use Pattern in 2015**  
 (Area in Per cent)

Tahsil	Geographical Area	Forest Cover	Land not Available for Cultivation	Fallow Land	Area under Agriculture
Mahabaleshwar	22190	59.66	3.77	7.76	28.82
Wai	61909	20.62	4.81	15.29	59.28
Khandala	53608	12.12	17.50	28.26	42.11
Phaltan	119029	9.15	14.10	31.18	45.57
Man	150787	8.59	16.76	36.07	38.58
Khatav	136457	3.02	8.28	20.96	67.74
Koregaon	94840	11.07	9.33	22.78	56.83
Satara	87953	9.66	14.67	17.74	57.93
Jawali	86895	22.77	13.09	21.25	42.90
Patan	140364	19.75	11.27	22.96	46.03
Karad	104211	10.17	5.71	7.03	77.09
<b>District</b>	<b>1058243</b>	<b>13.00</b>	<b>11.47</b>	<b>22.84</b>	<b>52.69</b>

Source: - Socio-Economic Review of Satara District -2015.

### Area under Forest:

The western part of the district is covered by **Sahydri** hilly region therefore dense forest cover is observed in this hilly region. In the district 13 per cent of land is covered by forest. The tahsil wise distribution of forest is shows the diversification. The Mahabaleshwar tehsil has highest forest cover i.e. 59.66 % and Khatav tehsil has lowest i.e. 3.02 % forest cover. In general forest cover is decrease western to eastern part of the study region because eastern part of the region is drought **porn** region. The semi evergreen monsoon forests are present in study region.

**Land not available for Cultivation:**

This group includes the land under non agricultural uses, barren and uncultivable land. Area under non agricultural uses includes land occupied by buildings, road and railway network, water bodies etc.

Barren and uncultivable land includes rocky and hilly areas, and inaccessible area in nature. In the study area average proportion of such land is 11.47 per cent. Highest proportion is observed in Man (16.76%) tahsil and lowest was in Mahabaleshwar (3.77%) tahsil with 1.91 percent.

**Fallow Land:**

Fallow land means a land which is not under cultivation at present but it was under cultivation in the past. It can be divided into two groups that is current fallow and permanent fallow land. 22.84 per cent fallow land is observed in the study area. At tahsil level, proportion of fallow land above the average is noticed in Khandala (28.26 %), Phaltan (31.18%), Man (36.07%) and Patan (22.96%) tehsils and remaining tehsils located below district average. The lowest Fallow land observed in Karad (7.03%) tehsil and highest fallow land observed in Man (36.07%).

**Area under Agriculture:**

The land which is actually under crops during the current year is called as Area under Agriculture or net sown area. Nearly 52.69 per cent proportion of land is under various crops in the study area. Highest proportion of net sown area is noticed in Karad (77.09 %), Khatav (67.74%), Wai (59.28%), Satara (57.93%) and Koregaon (56.83%) tehsils which is above district average. It is due to fertile soils and availability of water. The region falls under Krishna - Koyna basin. The lowest proportion of net sown area is observed in Mahabaleshwar (28.82%) tehsil due to hilly region.

**Landuse Efficiency:**

There is scope for extension of cultivated land by bringing fallow and potential agricultural land under cultivation. Therefore immediate need is to give more emphasis on intensity of cropping and increasing yield from existing calculated area problem of under use of net sown area low productivity and risk of crop failure are taxing the rural population. Therefore, it is fruitful to investigate the degree of intensity with which the net sown area is utilized.

Landuse efficiency may be defined as the extent to which the net sown area is cropped. The gross cropped area percentage of the net sown area gives a measure of landuse efficiency which means the intensity of cropping.

The index of landuse efficiency is obtained by using the following formula.

$$\text{Index of landuse efficiency} = \frac{\text{Net sown area}}{\text{Gross cropped area}} \times 100$$

**Table No. 2: Landuse Efficiency in Satara District. (Area in '00' hectares)**

Tahsil	Gross Cropped Area	Net Sown Area	Index of Landuse Efficiency
Mahabaleshwar	8116	6468	79.69
Wai	46167	50112	108.55
Khandala	37726	40903	108.42
Phaltan	91353	64419	70.52
Man	112564	55851	49.62
Khatav	121041	83428	68.93
Koregaon	75577	68817	91.06
Satara	66409	92158	138.77
Jawali	55721	45355	81.40
Patan	96809	92950	96.01
Karad	87640	95278	108.72
<b>District</b>	<b>799123</b>	<b>695739</b>	<b>87.06</b>

Source: Compiled by the author

### **Areas of Low Intensity (Below 75 %):**

Areas of low intensity are distributed in Man (49.62%), Khatav (68.93%) and Phaltan (70.52%) tahsils, due to drought prone region which characterized low rainfall less fertile soil.

### **Areas of Medium Intensity (75 % to 100%):**

Areas of medium intensity are confined to Mahabaleshwar (79.69 %), Koregaon (91.06%), Jawali (81.40%) and Patan (96.01%). This tehsils has well developed irrigation, fertile soil conditions but due to present of hilly region is responsible for the medium landuse intensity.

### **Areas of High Intensity (above 100 %):**

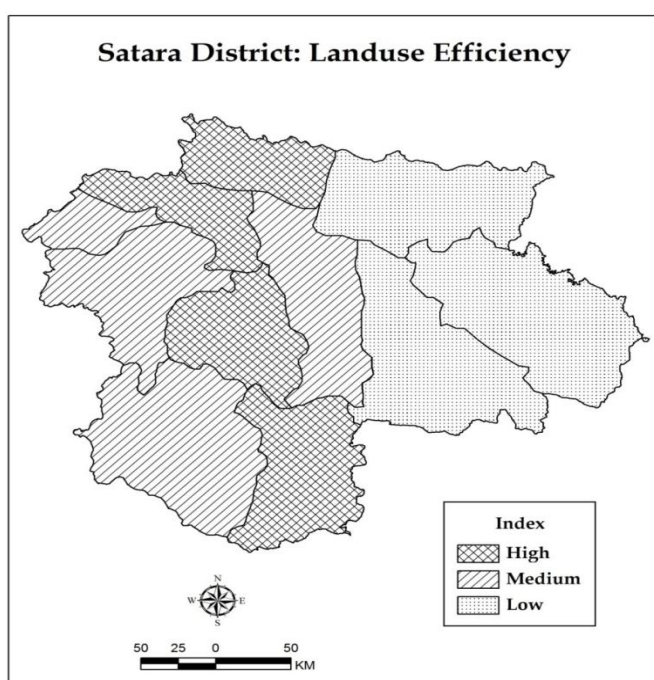
High intensity was found in Wai (108.55 %), Khandala (108.42%), Satara (138.77%) and Karad (108.72%) tahsils, because of well developed irrigation facility and fertile plain region with black soil as well as developed agricultural techniques present in the region gives the high intensity of landuse.

### **Conclusion:**

The study region has low area under forest is observed with 13 percent, it needs increase in forestation. Net sown area is quite significant in the study region basically riverside fertile plain region has more area under cultivation. Proportion of the fallow land is high in the eastern part of study region, which can be brought under cultivation by providing irrigation facility. Landuse efficiency is high in the tahsils such as Wai, Khandala, Satara and Karad because of well developed irrigation facility and fertile plain region with black soil. There is need to proper agricultural policy for agricultural developments in the hilly as well as eastern part of study region.

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## E-Agriculture Information System

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### Introduction :-

The Statistical data includes farmers who were asked whether or not they have incurred unusual high rainfall events, such as a storm or heaving downpour.

Technically, in machine learning the likelihood of reporting a storm is correlated with treatment in the Instrumental Variable and heterogeneous effect regressions, which gives up, farmers a more likely report of incurring a storm. Farmers who had received regular weather information became more aware of unusual rainfall events, which became more likely to report them to enumerators. The reports stated whether the farmers receiving were able to reduce output loss or increase output with the storm.

- We find no evidence that this is the case.
- We also find little evidence of beneficial heterogeneous effects.
- Young farmers were reportedly found to have more output loss at harvest in the following storm, not less.
- In India, Agriculture is believed is believed as a major occupation for a most part of population.

Most rural population depends upon agriculture as their important occupation. Yet, agriculture in India is in stagnation and in turns needs renewal, the leading cyber security ,Techno legal ICT and cyber law specialist of India and the managing member of ,Association for people of India, the agriculture development characteristics are analyzed keeping in mind the advent of e-agri- culture in India.

### The current scenario of agriculture in India

The agriculture sector in India is currently facing a difficult phase. India is moving towards an agriculture emergency due to inadequate investment in irrigational and agriculture infrastructure, lack of attention, ineffective land management, non-given of fair prices to farmers for their crops and insufficient land reform in India, etc. Food production and productivity in India is declining while its food consumption is increasing. The situation has further been worsening due to use of food grains because of demand of bio fuels. As India does not have ports and logistical systems for large - scale food imports, the solution of import of food grains would be difficult.

### The Indian agriculture Problem Definition: -

The Indians food production and productivity has been increased for agricultural purposes. The developed nations are using technology of laser in place of tractors to plough lands. This helps in optimizing the use of a range of inputs parameter such as water, seeds, fertilizers, etc. The problem occurs here is that Indian farmers cannot pay for this technology. In addition, power and electricity also cause a major problem for Indian farmers and choice of power like solar energy panels, regulated and optimized by ICT.

### E-Agriculture :-

“E-Agriculture” is an emerging field in the connection of agricultural informatics, development and entrepreneurship which is focussing to agricultural services, technology distribution and information delivered or developed through the Internet and associated technologies. Specifically, it engages the conceptualization, design, development, assessment and application of innovative ways to use active or emerging information and communication technologies .

E-agriculture is a rising field for enhancing existing agriculture and food security through enhanced processes for knowledge access and switch using information and communication technologies. The World Summit on the Information Society . Plan of Action comprises e-



Agriculture as a region of function of information and communication technologies . In short e-Agriculture will connect all concerned persons starting from farmers to researchers together. Farmers can get the desired information at any instant of time from any part of world and they can also get the help from experts viewing their problem immediately by without moving anywhere.

### **Other Related Work :-**

The following have been analyzed and studied in order to develop an alert system for farmers:

- - A study which is conducted at majority of farmers in Kenya who are not able to sell. their produce at market price due to lack of sufficient information available. Also the agricultural productivity is being lessen due to the lack of information and resistance developed by the agricultural universities. For such farmers to produce and sell their products at market based competitive prices, information communication technologies tools have be availed to them. This is because the development of agriculture is dependent on how fast and relevant information is provided to the end users. The study concentrated in other County since it is the heart of Kenya. A lot of research has been conducted in this area, but no research has been to ascertain the awareness, adoption, legislative and regulatory framework, therefore it is must to determine the current research trends in the use and adoption of e-agriculture of e-Agriculture in Trans Nzoia County..
- This paper estimates the benefits of the Indian farmers if the market and weather information is delivered to their mobile phones. And this has been conducted with a randomized experiment in 100 villages of Maharashtra. This service has been sent in by a commercial service called Reuters Market Light (RML). The treated farmers associate RML information with a number of decisions they have made in the agriculture, and we find that the treatment affected spatial arbitrage and crop grading. But the magnitude of these effects is small. We find no statistically significant average effect of treatment on the price received by farmers, crop value-added, crop losses resulting from rainstorms, or the likelihood of changing crop varieties and cultivation practices.
- The information that are relevant of the required quality always have the potential of increasing efficiency in all spheres of activity of an Indian farmer, therefore the emerging scenario of the deregulated agriculture, has brought a „need“ and urgency to ensure it in an integral part of decision making. Subsequently, exploring IT as a strategic tool for the benefit of rural India of assumed importance. Here the information meets the Indian farmers in general which are documented extensively. The broad information inputs can be classified as:
  - Awareness Databases - those that facilitate proper understanding of the implications of the WTO on Indian agriculture.
  - Decision Support Systems - information that facilitates farmers to make a proper SWOT analysis to take appropriate decisions.
  - Systems that facilitate Indian farmers to forge appropriate alliances for collective benefit.
  - Information on new opportunities .
  - Monitoring systems for corrective measures .

Recent publications demonstrate the following : First and foremost, it is essential to provide an. unambiguous interpretation and implications for ordinary people. The jargon and the language under various articles of WTO require to be distilled by experts and their implications are clearly to be spelled out for all the segments of Indian agriculture and allied activities. The implications for all the stake holders and the time frames are to be spelt out. This is a priority item which is to be addressed immediately. The mandatory changes in government policies on tariffs, imports, year wise phasing of the same, the impact on various subsidy schemes would be of concern to people. An area of immediate concern to farmers is to get an analytical input on how his/her life is going to be affected. Since removal of restrictions throw open Indian agricultural markets, the macro economic situation related to foreign exchange, inflation, the current tariff structure within and outside the country etc. and their likely impact on Indian agriculture will have a direct bearing on the decisions of segments of Indian agriculture.

- Decision Support Systems for is more important and usually avoids risk developing environments. It has been suggested that the WTO is stipulating reductions for export subsidies on farm products will make Indian exports more competitive. It has been estimated that the export potential may increase upto \$ 1.5 billion by 2020. The advantage of the emerging order, is that the Indian farmer needs to be equipped with information that have been facilitated by undertaking a proper SWOT analysis and its comparison may led to conventional wisdom and satisfy himself on an appropriate course of action. The Available information does not satisfy which projects on the weaknesses of the adverse affect of WTO on any specific agricultural product will help in taking the necessary corrective measures. In the present scenario, the competitive advantage is necessarily required to be fully exploited for increasing the export potential.

**Methods :-** The step by step process of proposed framework is as follows:

1. Information passed on daily basis
2. Information passed on seasonal basis
3. Other details Information regarding agriculture.

#### **Information passed on daily basis :-**

The Administrator has to be registered and logged into their organization. The database can be maintained consists of Farmers details and Crops details. Farmers details such as Username, password and mobile number. Crop details such as Wind, Humidity, Air temperature, surrounding temperature and Crop.

In this phase, farmers receive the information regarding agriculture parameters such as Prices of Crop details, Prices of fertilizers, Weather conditions etc. This information can be sent to farmers through SMS via SMS Gateway.

#### **Information passed on seasonal basis :-**

In this phase, particular farmers receive the information on seasonal basis. To do this the farmer details in the database has been clustered. The clustering of farmers details can be done by using data mining technique called birch clustering which is one of the Hierarchical clustering method.

#### **Other details Information regarding agriculture :-**

The other detail information included in this phase is as follows:

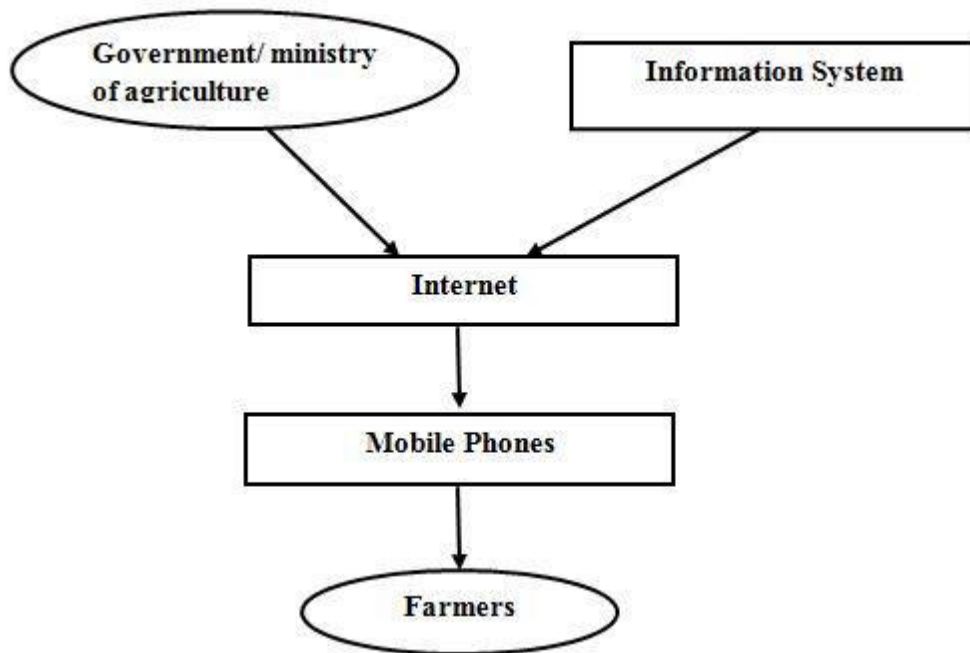
1. Announcement form agriculture board
2. Board members update of agriculture
3. Additional Crops and fertilizes details. Etc

Besides from details of daily and seasonal basis, the above additional or other details can be sent to farmers whenever the additional information provided by the agricultural board or from agricultural members

#### **System :-**

For improving agricultural productivity an expert ,agricultural advice is given to the farmers both in a timely and personalized situations. Here, in this system agricultural experts generate the advice by using the modern agriculture which is highly knowledge intensive which also requires timely, reliable and accurate information on natural resource endowments and their usage patterns at present and future technology available for their utilization and other information about markets, weather, insurance, subsidy, etc.

The Architecture of the proposed system is as follows:



The news releases from the government does not reach the farmers in time, therefore an alert system is being built for daily releases and for seasonal releases.

### Conclusion :-

Based on the results obtained from the above, the following conclusions were made:-

- Majority of farmers in the state or country are not aware that mobile phones can be used to conduct businesses and receive information. Mobile phone costs should be lowered to enable majority of farmers for having access to the current information about agribusiness within the state or country.
- eAgriculture has not been implemented because farmers in the country have not been sensitized about it & young farmers were in lack of information about the agriculture such that e-agriculture might provide them useful information regarding the plantations that they have grown.
- The government should also conduct sensitization to create awareness for the farmers on how best they can use information technologies to conduct agribusiness.
- Illiteracy among farmers in reading message is also another factor that pertains the usage of technology in agriculture, to overcome this it is necessary to create awareness of learning the state language such that the message sent will be in the state language.

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## The Representation of the Major Rural Problems in the select Indian English Novels: A comparative study

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**Keywords:** sensibility, highlighting, perspectives, exiguous.

The Concept of Globalized villages is the manifestation of modern culture. Many developmental plans are working today to change village picture. Many other development programs are to be arranged for the villagers. The farmer is supposed to be backbone in financial situation of the nation by the Government. Many schemes are provided to the farmer for his help in developing agriculture. It means it is fact that the work of development is in progress but it is not adequate for nation still it is need to show that this development is very limited in such a large country like India. It is also high time to see the fact that our whole development of nation is mainly concerned with village. The dream of Dr. A.P.J. Abdul Kalam that India will be developed country at vision 2020. This situation is complicated even today.

This fact has been discussed by many writers in those days still it is need to remind them today once again with their literature.

The picture of Indian villages, particularly in rural areas is the little bit same even today. That is why it is necessary to consider rural literature from the writers point of view. This paper shows the reality of villages.

The present paper intends to attempt a comparative statement on rural life by focusing on major rural issues and problems. The paper deals with overall assessment of selected novels of Vyankatesh Madgulkar and Mulk Raj Anand. The Marathi Novel *Bangarwadi* translated as *Village had no walls* is compared with another Indian English Novel *The Old Women and the Cow* by Mulk Raj Anand. Both Novels are taken up for detailed evaluation of village with its all situations as the realistic picture of rural problems. The present Novelists depict all rural aspects of Indian society will typical problems of village community. In style and manner both writers concern with mainly social rural problems. As modernist writer these novelists wanted to bring social change in the life of villages.

The trend of comparative literature is newly discussed phenomena in national and international conferences, various reputed journals, and literary and academic study centers. It explores the potential for the comparative literature. The comparative literature is important of languages and literatures.

The comparative study attempts to transcend the narrow confines of a single area of subjects and searches for similarities between text and authors from different regional backgrounds. While comparing more than one work in the same or different languages, it cuts across national boundaries with thematic and stylish similarities. This paper studies two different literatures that develop a sense of universality of literature.

The aspects of rural life may be partly different from each other but both the select novelists attempt a discussion of rural life.

In both novels all household live in agriculture. The farmers are tilling their own land. Tilling others or working as farm laborers. The houses in the village are flat-roofed and built in stone, brick, etc. Some people live in huts. The main occupation among country folk is agriculture but they also keep pets such as cows, Goats, Sheep's, Hens, Bullocks, etc. The condition of people in selected villages is very poor and deprived. All characters are Shaken because of poverty and humbleness. The main reason behind this situation is both villages are drought-stiken areas.

Shri.V.Subramanian defines drought as:

“Drought is a dry phenomenon; it is a dark spectre on an otherwise benevolent horizon. It envelopes millions in distress and leaves a long trail of misery behind. The scars it leaves on mother earth take years to heal. The rural peasantry is left licking its wounds and rises but slowly from its emasculation”

(Subramanian, 1970-73: IX)

In Both present novels the village suffers from drought. The condition is very poor. There are no crops. The drought is severe. In the village of *Bangarwadi*, the picture of drought described by Vyankatesh Madgulkar describes as;

“--- week after week passed without a drought of rain;

The burning earth did not get a chance to cool down; the tree and shrub

Become dry as dust--- The starving sheep cleaned up every morsel of Chaff

There was to be found. The drought was severe.”

(The Village had no walls, 1958, Asia publishing house, Bombay,p.124)

**Life and work of Novelists:** Mulk Raj Anand was born in 1905 in Hindu Kshatriya family. He was the first and foremost Indian English Novelist and writer. His writings are concerned with problems of poverty and hunger, economic exploitation and class distinction, etc. *The Old Woman and the cow* (1960) is a picture of village peasant. It is a story of female character, Gouri and her husband, panchi a peasant couple. The story is mainly concern domestic kind but it is also related to whole social village practices. The novel is pure rustic novel with its all local colors, Indian village sensibility and so many other aspects of rural life. The novel is Indo-Anglican novel of the modern time. The realistic picture of society is the principle characteristics of novel. As many other novelists Mulk Raj Anand attempted to present the social structure of Indian rural society remaining faithful to the reality of the social order. In literature many writers began to think to change social reality. The present writer had played a role of social reformer to bring a change for the social rural problem. The present select novel ‘*The Old Woman and the Cow*’ highlights the major problems in Indian rural society as poverty, exploitation, migration, landlordism, natural calamities, women’s position, etc.

Vyankatesh Digambar Madgulkar was born on 1927 in village madgule in Sangali district. The writer describes all rural activities with full of rural problems and hardships. He gives vivid picture of Indian Rural life. As one of the four leaders of Naavkatha, ( New story ) Madgulkar stands alone among the foursome in the writing cheaply about rural life. His all novels like *Vaavatal* ( 1964 ) translated as *The Winds of Fire, Mandeshi Mansa* and many others have rural background. He writes real life experience to show complete picture of village life which has a problems of economic imbalance and social inequality. The writers focuses on village Bangarwadi itself and succeeds in presenting village with its complex structure of social economic divisions.

The present writer offers an example of an awesome demonstration of human behavior. He has playfully sketched all village characters in his novel *Bangarwadi*.

*Bangarwadi* is the village of Bangers is its name from an exiguous Shepherd community. It conveys the problems and sufferings in the life of villages. The Novel is also detailed sketch of rural life with full of rural aspects as; village picture, people and their nature, Social awareness, religious perspectives village mannerisms, village sensibility and politics, etc. The study of this present novel in general will be study of Indian rural life focusing rural life and highlighting major problems.

Both novels are not mere fiction but they give realistic representation of agriculture. The often visiting drought in the villages PiplanKalan, chotaPiplan and village Bangarwadi in the present select novels.

*The Old Woman and the Cow* and *Bangarwadi* is an unparalleled calamity. The village hilly areas in the texts are examples of lower temperatures and less humidity with low degree rainfall. Thus the erratic nature of the monsoon circumstances therefore, farming practices and cropping patterns have necessity to be adjusted to the rainy season, climate and soil. The uncertain and low rainfalls do not permit cultivation even during the harvest.

The Women characters in the select novels have different roles. Their life picture in the novels is with many hardships and difficulties. There female characters play a role of general village woman as vigorous participants in the family to her share of domestic as well as farming duties.

The soil in the villages refers as dry and parched. No irrigation facilities available in the villages. The people in the both novel are waiting for the rain. The picture of the drought has clearly pointed out by the select novels. The villages mentions through novels are representation of drought prone area which find it difficult to solve many problems increased in the farmer’s life. The Problem of poverty is more complex in this drought prone area. The conditions of life of these villagers leads another severe problems like High level of illiteracy and poor development of infrastructure.

The people in the village are badly affected by sufferings hardships, but they look upon sufferings are as an imagery as nature and God’s Wrath. They blame each other. They are suspicious and suffers lot in this fact.



The people in the villages live in poverty for years. There are no facilities for them. The people in the villages are completely ignorant of modern concepts of development. The Unemployment is big problem in their villages. Hence, the survival of rural people is itself is a problem. These rural families live for ages in some poverty and distress.

The Tragic end of the texts should uncertain future in their dirty and undeveloped areas of the metro city. The rural economy of the Indian village has portrayed realistically by these writers is hardhearted. Both novels represent Indian village problems from every corner of village life. All these problems in the novel are recent problems even today. The Problems of farmers have not yet been completely solved, at least many parts of country, these problems have actually become more complicated owing to new development. This fact cannot be denied in this modern progressive life. The Indian peasant finds himself much the same as earlier with his attitude as superstition, cultural practices etc, Both writers give a mouth to the every silent as true portrayed of Indian rural life. These select novels and their writers have significant relationships between specific writers.

These select novels and novelists have significant relationships. Both novels give India's complex issues through the villages in rural societies. Both writers have portrayed true portrayal of Indian rural life with social observing of reality in India. The study of rural life in these select novels show that both writers deal with village as a changing phenomenon, as a problem. In the light of this comparison of rural life with each other, it is found that, the rural problems have deeply rooted in Indian villages. Both writers have twin like resemblance each other in their attitude, social awareness, realistic point of views, depicting rural picture and so on. Both novels are basically the same in the subject matter that is the representation of the major rural problems in the select Indian English novels. These problems mainly affect Environment for its degradation. The Environmental problems faced by rural villages even today are as: Poor Sanitation and appeal for the poor health and health care requirements.

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## Evaluation of Role of Crop Insurance in Agriculture Sector

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### Abstract :

*Agriculture play a vital role in Indian's economy. Keeping in view agricultural risks ministry of agriculture introduced a crop insurance scheme in 1985. Insurance is the way of covered different type of risk. To enlarge the coverage in terms of farmers, crops and risks, National Agricultural Insurance Scheme (NAIS) was notified/ implemented with effect from 1999. Weather Based Crop Insurance Scheme (WBCIS), Coconut Palm Insurance Scheme (CPIS) and Modified NAIS (MNAIS) were introduced on pilot basis from Kharif 2007, 2009-10 and Rabi 2010-11 respectively. To make the crop insurance schemes more farmers' friendly, a re-structured Central Sector crop insurance scheme namely, "National Crop Insurance Programme (NCIP)" was implemented by merging erstwhile Pilot schemes of Modified National Agricultural Insurance Scheme (MNAIS), Weather Based Crop Insurance Scheme (WBCIS) and Coconut Palm Insurance Scheme (CPIS). Pradhan Mantri Fasal Bima Yojana (PMFBY) has been approved for implementation from Kharif 2016*

### Introduction:

Agriculture play a vital role in Indian's economy . 54.6 % of the population is engaged in agriculture and allied activities & its contributes 17.4% of country's Gross Value Added for the year 2016-17. Government India took several steps for its sustainable development in agricultural extreme weather conditions such as floods . Drought , heat waves , cyclones and hailstorms cause extensive crop damage , climate change increases agricultural risk. Keeping in view agricultural risks ministry of agriculture introduced a crop insurance scheme in 1985 and thereafter brought improvements in the scheme from time to time based on experience and taking views of stakeholders.

Insurance is the way of covered different type of risk. Life insurance and general insurance are main type of insurance.

Farmers preliminary face two types of risks- Yield risk and price risk. An unplanned and major variation in either the yield and price of a crop in a particular agriculture cycle can significant losses to the farmer.

Yield risk refers to uncertainty regarding the quantity and quality of agricultural product harvested at the end of agricultural cycle. Erratic rainfall distribution has adverse impact on agricultural production. In last fifteen years there has been several years when deficiency in rainfall has adversely affected agricultural production.

Price risk refers to uncertainty about price that farmers receive for their product during year of high production prices of crops slide downwards affecting the income of farmer.

### Objective of study :

- 1) Study the evaluation crop insurance in India
- 2) Compare the different scheme of crop insurance
- 3) Understand the difficulties in implementation of crop insurance scheme
- 4) Give suggestions for proper Implementation of crop insurance scheme

Data used : For the study researcher collect information from secondary data from various research papers , different report and statistical report .

### Evolution of crop insurance in India :

Keeping in view the risks involved in agriculture and to insure the farming community against various risks, Ministry of agriculture introduced a crop insurance scheme in 1985 and thereafter brought improvements in the erstwhile scheme(s) from time to time based on the experience gained and views of the stakeholders, States, farming community etc. To enlarge the coverage in terms of farmers, crops and risks, National Agricultural Insurance Scheme (NAIS) was notified/ implemented with effect from 1999. Weather Based Crop Insurance Scheme (WBCIS), Coconut Palm Insurance Scheme (CPIS) and Modified NAIS (MNAIS) were introduced on pilot basis from Kharif 2007, 2009-10 and Rabi 2010-11 respectively. To make the crop insurance schemes more farmers' friendly, a re-structured Central Sector crop insurance scheme namely, "National Crop Insurance

Programme (NCIP)" was implemented by merging erstwhile Pilot schemes of Modified National Agricultural Insurance Scheme (MNAIS), Weather Based Crop Insurance Scheme (WBCIS) and Coconut Palm Insurance Scheme (CPIS) (as its components) with some improvements for its full-fledged implementation from Rabi 2013-14 season throughout the country. National Agricultural Insurance Scheme (NAIS) was to be discontinued after implementation of NCIP from Rabi 2013-14 season, but due to some inherent issues under NCIP, at the option of States, NAIS was also allowed for implementation upto 2015-16. The erstwhile crop insurance schemes have further been reviewed in consultation with various stakeholders including States/UTs. and a new scheme namely, **Pradhan Mantri Fasal Bima Yojana (PMFBY)** has been approved for implementation from Kharif 2016 along with pilot Unified Package Insurance Scheme (UPIS), Restructured Weather Based Crop Insurance Scheme (RWBCIS) and Coconut Palm Insurance Scheme (CPIS).

#### **Pradhan Mantri Fasal Bima yojana (PMFBY)-Kharif -2016 onwards :**

##### **Feature of new scheme:**

- i) Sum Insured : sum insured is equal to the scale of fiancé for the crop as fixed by District level technical committee . Sum insured for individual farmer is know equal to the scale of finance per hectore multiplied by area of notified crop proposed by the farmer for insurance .
- ii) Premium rate: The premium rates payable by farmers for food crop and oil seeds as fixed at 2 % of the sum insured or Actuarial rate whichever is less for kharif season and 1.5 % for rabi season. For commercial / horticultural crops premium rate of 5 % is fixed to be paid by the farmer. The difference between premium rate and rate of insurance payable by farmers will be shared by the central government and state government equally as premium subsidy.
- iii) Time frame for loss assessment : the cut of date of receipt of yield data is within one month of final harvest . processing approval and payment of final claims is based on the yield data and it is to be completed within three weeks from receipt of yield data .
- iv) Timely release of premium subsidy to insurance companies : both government must release 50 % of share of premium subsidy to insurance companies , in the beginning of every crop season based on fair estimate submitted by them and balance of actual premium subsidy for season as soon as final figures are submitted by insurance company.
- v) Use of modern technology : with the primary objective to reduce the delays in claim payment to farmers. Capturing of CCEs data on smart phones/CCE Agri App and its real time transfer on Crop Insurance Portal has been made mandatory from Kharif 2017 and the States have to provide an evidence of having conducted CCEs before Government of India share in subsidy is released. Remote sensing will be used to rationalize the number of crop cutting experiments at unit area level.

##### **Evaluation of performance of crop insurance scheme before PMFBY:-**

CCIS covered cereals, pulses and oilseeds. The premium rates were administered Uniformly throughout the country. It was kept at 2 percent for rice, wheat and millet crops and 1 percent for pulses and oilseeds. It was subsidized by 50 percent for small and marginal farmers. however, high claim to premium ratio, which was 6.72 for an average of 15 Kharif seasons (1985-99), and 5.75 for an average of 14 Rabi seasons (1985-86 to 1998-99), made the scheme financially unviable. The sum insured was to be limited to Rs 10,000 per farmer,6 irrespective of the size of loan and farm size (Report of the ommittee to Review the Implementation of Crop Insurance Schemes in India, 2014). This scheme was replaced by NAIS in 1999-2000 which was further modified and Renamed as Modified NAIS during Rabi 2010-11. WBCIS was introduced in 2007.

##### **Some of the limitations of these schemes are as follows:**

Low penetration of agricultural insurance -The penetration of agricultural insurance in India was low and stagnant in terms of the Area insured and the number of farmers covered till 2014-15. In the three years period (2013-14 to 2015-16), the average area insured under all the schemes combined was 16.3 million hectares in the Rabi and 29.7 million hectare in the Kharif. The number of farmers insured was 13 million in the Rabi and 25 million in the Kharif for all the schemes. The primary reason for low coverage was unaffordable high premium rates and capping of premium and sum assured under MNAIS. The average premium rate was around 10 per cent for MNAIS and WBCIS.

##### **Premium and sum insured related issues-**

The sum insured was worked by multiplying the Notional Threshold Yield with average farm gate price. However, in MNAIS and WBCIS, premium rates were calculated on actuarial basis, (which was a departure from the administratively decided premium rate that prevailed during NAIS)

and they were capped in order to reduce total expenditure on premium subsidy by both Central and state governments. Sum insured per hectare was reduced to an amount to commensurate with capped premium rates and this led to low sum insured for most of the crops. As actuarial premium rates under MNAIS were high for most of the insured crops in many districts, sum insured in certain cases was insufficient to even cover the cost of cultivation.

**Delay in assessment and settlement of claims-** The assessment of damage was based on the traditional system of crop cutting Experiments that took 6-12 months. The settlement of claims took unduly long time; at times it extended beyond the next cropping season.

**Area discrepancy-** The issue of area discrepancy has been prevalent since early years of crop insurance as in many cases, area insured was greater as compared to the net sown area as reported by the government agencies. According to PK Mishra Committee report (2013) this problem was acute particularly in some districts of Gujarat growing groundnut as major crop. In Kharif 1993, the claim for groundnut alone was Rs 192.96 crore out of a total claim Rs.207.42 crore for all crops. The problem of area discrepancy continued even after the introduction of NAIS in Gujarat in Kharif 2000. To solve this problem of fudging of data by state machinery, area correction factor was applied by AIC but the states showed unwillingness to apply such correction factors.

**Rolling out PMFBY: Experience of Kharif 2016 and Rabi 2016-17**

With the new and improved features of PMFBY, overall area insured has increased marginally by 6.5 percent (from 53.7 million ha in 2015-16 to 57.2 million has in 2016- 17) . However, over the same period, the number of farmers insured has increased by 20.4 Percent (from 47.5 million to 57.2 million), the sum insured has increased by 74 percent (from Rs. 1,15,432.4 crores to 2,00,618.9 crores), and premium paid has increased by 298 percent (from Rs 5,491.3 crores to Rs 21,882 crores). India has definitely taken a leap forward and it appears that a structural breakthrough has been chieved for which government of India deserves appreciation. But the use of mobile based technology, smart Crop Cutting Experiments(CCEs), digitization of land record and linking them to farmers' account for faster assessment/settlement of claims are some of the steps that are yet to be fully accomplished for effective implementation of the new crop insurance scheme.

**Farmers Insured:**

The total number of farmers insured has increased by 20.4 percent (from 47.5 million to 57.2 million between 2015-16 and 2016-17. The new crop insurance scheme has provided Average to 38.9 million farmers in Kharif 2016 as compared to 25.4 million farmers in Kharif 2015, an increase of 53.1 percent (Table 1a). In Rabi 2016-17 the number of insured farmers insured under PMFBY is 16.2 million, an increase of 17.4 percent from Rabi 2015- 16.

**Farmers Covered (million) under NAIS, WBCIS, MNAIS and PMFBY:  
 (Kharif 2013 to Kharif 2016:-**

Season	NAIS	MNAIS	Total	% Increase	WBCIS	Grand Total	% Increase
Kharif 2012	10.7	2.1	12.8		8.1	20.9	
Kharif 2013	9.7	2.4	12.1	-5.5	8.9	21.00	0.5
Kharif 2014	9.7	5.9	15.6	28.9	8.2	23.8	13.4
Kharif 2015	20.6	4.8	25.4	62.8	5.4	30.8	29.4
Kharif 2016	38.9		38.9	53.1	1.5	40.4	31.2

**Farmers Covered (million) under NAIS, WBCIS, MNAIS and PMFBY:  
 (Rabi 2013 to Rabi 2017) :-**

Season	NAIS	MNAIS	Total	% Increase	WBCIS	Grand Total	% Increase
Rabi 2012-13	6.1	1	7.1		5.6	12.7	
Rabi 2013-14	4	3	7	-1.4	5.3	12.3	-3.1
Rabi 2014-15	7.1	3.2	10.3	128.9	3.1	13.4	8.9
Rabi 2015-16	10.1	3.7	13.8	34	2.9	16.7	24.6
Rabi 2016-17	16.2		16.2	17.4	0.6	16.8	0.6

**Crop Area Insured under all insurance schemes:**

Year	Gross area sown (area in lakh hect. )	Area insured (area in lakh hect	% of area insured
2015	1983.60	441.41	22.25
2016	1983.60	523.86	26.41
2017	1983.60	567.92	28.63

Source: Department of Agriculture cooperation & farmer welfare.  
 Area covered under show increase trend which means increase in crop insurance. But Price

risk is still not covered and farmers remains exposed to volatility in price of Agriculture commodities.

The total funds released by Government of India during last 3 years under various schemes for crop insurance are as under:

Plan/ Year	Expenditure ( Rs. In crore)
2014-15	2598.35
2015-16	2982.47
2016-17	11054.63

Expenditure on crop insurance increases from 2015 to 2017 by 8456.28 crore.

### **Challenges in the Implementation of PMFBY:**

#### **Actuarial Premium rates and premium subsidy:**

With an increase in area insured it was expected that the actuarial premium rates would Go down. However, gross premium as a share of sum insured increased to 12.5 percent in kharif, 2016.

#### **Inadequate insurance coverage:**

Sum insured per hectare has increased to Rs 33,984 in Kharif 2016 and Rs 34,847 in Rabi 2016-17 under PMFBY. As PMFBY is yield based, price risk is still not covered and farmers remain exposed to volatility in prices of agricultural commodities.

#### **Insufficient and inefficient Crop cutting experiments (CCEs):**

The total number of CCEs planned by the government for both Kharif and Rabi season In 2016-17 was 9.27 lakh. With the CCEs being brought down to village panchayat Level ,it is expected that the number of CCEs will go up to 30 lakhs (20 lakhs in Kharif season and 10 lakhs in Rabi season). In the operational guidelines of PMFBY, the use of mobile based technology with GPS stamping has been mandated to improve the quality of data and make faster assessment of claims. However, neither the number of CCEs has increased nor have the State governments in most of the states procured mobile devices to make smart Assessment of crop yield.

#### **Assessment and payment of claims:**

The state government is responsible of yield data of CCEs to insurance companies and Claims are to be settled within 3 weeks from the date of data received, but companies not paid claim to farmers within time because they have not received premium subsidy from state government.

### **Conclusion:**

As after study the different reports and research paper the scheme theme of crop insurance is one of the best way for risk mitigation of farmers but there are requirement Of proper implementation and decision making and use of modern technology.

### **Suggestions:**

- 1) Government use the modern technology for claim assessment . use drone for crop images provide required infrastructure to district and panchayat level for fast sssessment of claim for correct and fast claim settlement taking help of ISRO and taking pilot study.
- 2) under the existing scheme compulsion for loan holder farmers, farmers who not taken loan they have not require to take insurance that's why very few farmers without loan taken are included requirement is that all the farmers are taken the crop insurance . for increasing farmers under crop insurance government require to increase premium subsidy .
- 3) Raising awareness and satisfaction among farmers through government agencies, insurance companies and banks.
- 4) Requirement of fast claim settlement which increase the excitement of farmers and they participate in insurance scheme .
- 5) Requirement of grievance redressed system for fast and speedy settlement of farmers complaint regarding crop insurance.

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www. Agricoop.nic.in  
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## Spatial Patterns of Literacy Variation in Kolhapur District : A Geographical Study [M.S]

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### Introduction :

Social geography can be defined as identification of different region of the earth surface according to association of social phenomenon relation to total environment .it is a study of pattern and process in understanding socially defined population in spatial setting ,it is a study of areal pattern and function relations of social group in the content of their social environment.

Education has long been recognized as vital to development,not only in fostering attitude conducive to economic and social change but also in meeting a basic need for all individual. Literacy levels may be a preferable guide to development as these purports to show the outcome of data educational process rather than just the inputs, but so far the availability of data presents serious limitation on these measures as a reliable indicator.

**Keywords:** Literacy, Education, etc.

### Objective of the study:

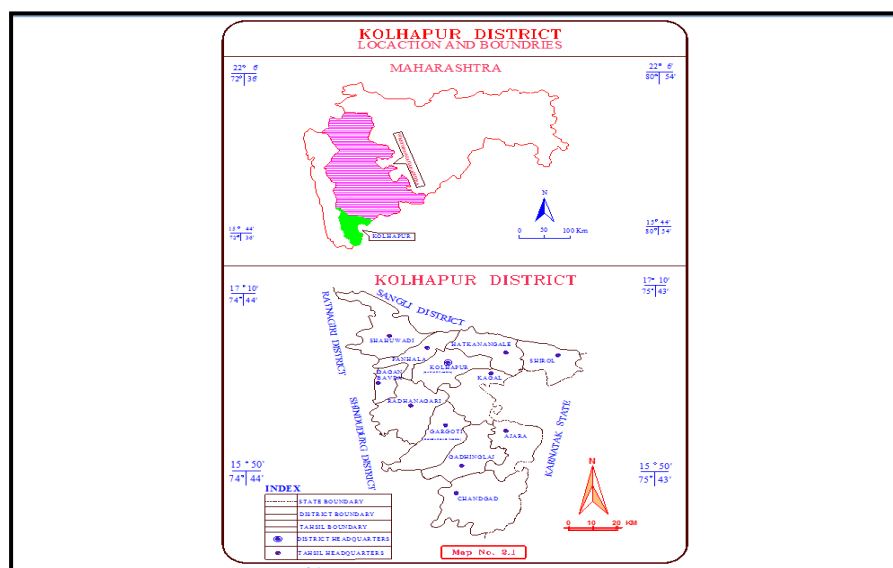
The main objective of the present paper is to find out and to measure variation among the literacy in Kolhapur region.

### Database and Methodology:

The present paper is based on Secondary Source of data. The data is collected from various sources which includes both published and unpublished books, government publication and private publications. Secondary data has been obtained from Census of India, District gazetteers, district statistical department, socio economic review and district statistical abstract of Study region district. Collected data is processed and presented in the tabular and graphical forms.

### Study Area:

Kolhapur district is situated in the Southern part of Maharashtra. It is located in between 15<sup>o</sup> 42' 30" to 17<sup>o</sup> 11' 25" North latitude and 73<sup>o</sup> 43' 10" to 74<sup>o</sup> 43' 45" East longitude. Kolhapur district is surrounded by Sangli district to the North, Karnataka State to the East and South, Ratnagiri and Sindhudurg districts to the West. The Sahyadri ranges to the West and Varna River to the North form the natural boundaries. For the administrative purpose, the district is divided into 12 tahsils i.e. Shahuwadi, Panhala, Hatkanangale, Shirol, Karvir, Bavda, Radhanagari, Kagal, Bhudargad, Ajra, Gadhinglaj and Chandgad.



The total population of the district is 38, 76,001 persons, as per 2011 census, it constitutes 3.45 percent population to the state total. The geographical area of district is 7746.40 square kilometer, which constitutes 2.52 percent of state.

**Result and Discussion :**

Mass education, adult education, free female education, distance education, through media and vocational training are some of the measure undertaken by the central government, state government and zillha parishad in bringing about massawakening. Apart from literacy as an indicator of development, the level of educational attainment needs to be understood especially in terms of the proportion of technical graduates, professional graduates and others including scientists.

**Literacy :**

A person who both read and write with understanding in any language is to be taken as literate by the Indian census. A person who can merely read but cannot write is not literate. It is not necessary that a person who is literate should have received any formal education or should have passed any minimum educational standard.

**Table No.1. Tahsilwise Change in Literacy Percentage in Kolhapur District:  
 (2001 To 2011)**

Sr. No.	Tahsils	Literacy Percentage		Vol. of Change in %
		2001	2011	
1	Karveer	83.16	86.64	3.48
2	Radhanagari	71.33	77.59	6.26
3	Gaganbawada	60.74	70.00	9.26
4	Bhudargad	72.92	77.71	4.79
5	Shahuwadi	66.93	72.68	5.75
6	Hatkangale	80.25	84.37	4.19
7	Shirol	80.15	83.44	3.29
8	Kagal	73.58	78.65	5.07
9	Ajara	69.37	73.93	4.56
10	Chandgad	66.67	72.94	6.27
11	Panhala	74.16	79.27	5.11
12	Gadhinglaj	71.81	76.62	4.81
District Total		76.93	81.51	4.58

*Source: Census of Kolhapur District, 2001 & 2011.*

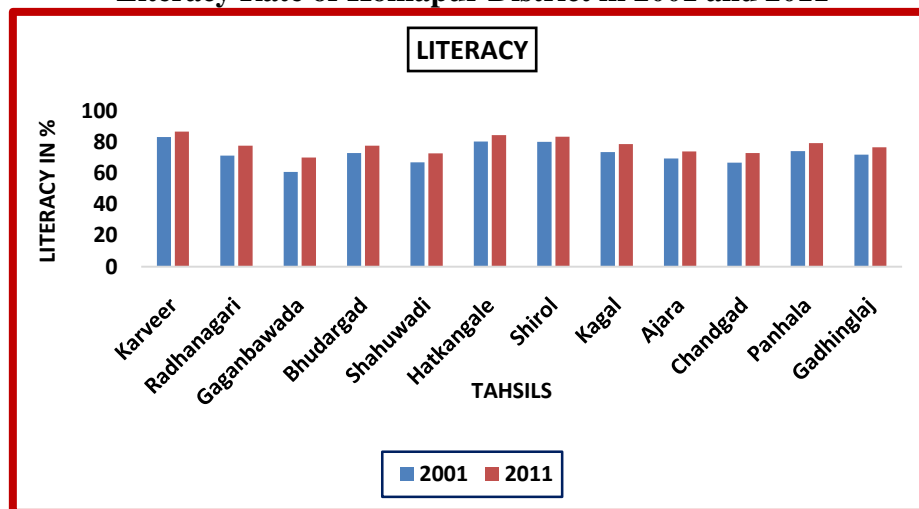
There are several studies which highlight the possibility of rising levels of education resulting into lower fertility. At a higher level of education, the process of attaining that certain level delays marriage and influence the traditional views on fertility. The higher levels of education and associated higher income may increase opportunities for work and leisure. This however brings about decline in the motivation for large families. This ultimate goal of education for all is to attain social and economic equity and is to attain social and economic equity and to a make it possible that an individual's participation become effective in national development.

The above table indicated that the highest (83.16%) literacy was observed in Karveer and the lowest (60.74%) literacy was found in Gaganbawada in 2001. Below 70% literacy was found in Ajara (69.37%), Chandgad (66.67%), Shahuwadi (66.93%) and Gaganbawada (60.74%) while 70-80% literacy was recorded in Radhanagari, Bhudargad, Kagad, Panhala and Gadhinglaj tahsils in 2001. Above 70% literacy was experienced in Karveer, Hatkangale and Shirol tahsils in 2001.

Among the various population characteristics, the aspect of literacy is quite significant in the contest of the development process.

In 2011, Above 80% literacy was noticed in Karveer, Hatkangale and Shirol tahsils whereas 70% to 80% literacy was observed in Radhanagari, Bhudargad, Shahuwadi, Kagal, found in Gaganbawada tahsil. About 9.26% positive change in literacy was took place in Gaganbawada tahsil.

### Literacy Rate of Kolhapur District in 2001 and 2011



#### Conclusions:

- 1) The above study concluded that literacy of Kolhapur district was increased during the period of 2001 – 2011.
- 2) In 2011, Above 80% literacy was noticed in Kolhapur, Hatkangale and Shirol tahsil whereas 70% to 80% literacy was observed in Radhanagari, Bhudargad, Shahuwadi, Kagal, Ajara, Chandgad, Panhala and Gaganbawada tahsil of the study region.
- 3) Below 70% literacy is found in Gaganbawada tahsil. About 9.26% positive change in literacy was took place in Gaganbawada tahsil in study region.

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## Geographical Analysis of Relative Humidity as a Indicator of Climate Change: Pune Division (Maharashtra)

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### Abstract

*The climate can thus be viewed as a mixture or aggregate of weather. Weather describes conditions of the atmosphere over a short period of time, and climate is how the atmosphere behaves over relatively long periods of time. The World Meteorological Organization (WMO), 30 years are the classical period for performing the statistics used to define climate. As a consequence, the 30 years period proposed by the WMO should be considered more as an indicator than a norm that must be followed in all cases. Climatic conditions help to shape various ecosystems and habitat around the globe. The climatic factors are impact on physical features as well as human life. It is a major role play in human environment and they also effects on his food, clothing, dwellings, and their occupations. Agriculture is our primary source of food; it becomes critical for human survival due to changing climatic conditions in the recent past few decades.*

*Changing climatic conditions in the Pune division of Maharashtra state has been considered for this work. The Pune division is located in the western part of Maharashtra, which is well-known for prosperity of agriculture and industrial sector. But it is presently affected by climatic conditions i.e. increase in temperature, uncertainty and variability of rainfall, durations of seasons etc. This all conditions are directly or indirectly connected with above sectors.*

**Key words:** *Climate, Temperature, Rainfall, Relative Humidity Properties, Variability, Agriculture, Industry, Mankind*

### 1.0 Introduction

Climate change is a change in the statistical distribution of weather patterns when that change lasts for an extended period of time that is decades to millions of years. Climate change, defined as the long-term imbalance of customary weather conditions such as temperature, radiation, humidity, wind and rainfall characteristics of a particular region, is likely to be one of the main challenges to mankind during the present century. As per Intergovernmental Panel on Climate Change (IPCC) usage climate change refers to a change in the state of the climate that can be identified by changes in the mean and or the variability of its properties, and persists for an extended period, typically decade or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity. This usage differs from that in the UNFCCC where climate change refers to a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods. Indian Metrological Department (IMD) suggests that climate change refers to a statistically significant variation in either the mean state of the climate or in this variability, persisting for an extended period typically decades or longer.

The humidity is one of the best elements of climate or weather it refers to an amount of water vapor presents in air at given time and place. The water vapor represents 2 per cent of the total composition of the atmosphere but this percentage varies both spatially and temporally as it ranges from zero to 5 per cent (Singh, 2007).

### 1.1 Study Area

The Pune division is located in south-west part of Maharashtra state. It lies between 15° 45' N to 19° 0' N latitude and 73° 32' E to 76° 15' E longitudes. The area under study comprises of five districts namely Pune, Sangli, Satara, Solapur, Kolhapur and the whole division has 58 tehsils. The Pune division is bounded by the Aurangabad district to the north and NE, Thane district encircled by north and NW. The west boundary of study area delimited by Raigad, and Ratnagiri district, Sindhudurg district enclosed in south and south-west part. The south and eastern boundary surrounded by Karnataka state and eastern boundary delimited by Osmanabad district.

Physiographical this region can be divided in to three parts hilly, plateau and lowlands. Sahydri ranges passes through Pune division; its slope decreases from west to east. In this region temperature varies in the different parts, the average temperature of the study area is 25.62° C. An average annual rainfall in the Pune division was recorded 1239.09 mm. There are major two river basins; it includes Krishna and Bhima basins.

The study region has total geographical area about 57, 275 km<sup>2</sup>. The study area having 23,449,051 population as per 2011 census and out of the total population of the study region more than 58.76 per cent population has been located in rural areas and remaining population 42.24 per cent are living in urban areas. The population density was 403 persons per km<sup>2</sup> and sex ratio was 953 females per thousand males according to 2011 censuses.

## 1.2 Objective

The objective of present research work is to study the relative humidity characteristics in relation to climate change of the Pune division of Maharashtra state (India).

## 1.3 Data Collection and Methodology

The present work is based on secondary data and an essential data was collected from different sources such as district gazetteers, district census handbook, socio economic abstract and toposheets (SOI). The metrological data was collected from institution i.e. Indian Metrological Department of Pune. Through this institution monthly station-wise data of relative humidity over Pune division (1979 to 2013) has been collected.

The India yearly temperature data had been taken through the website such as [www.indiawaterportal.in](http://www.indiawaterportal.in), [www.tropomet.res.in](http://www.tropomet.res.in) (1901 to 2011). The 0.25<sup>0</sup> X 0.25<sup>0</sup> gridded relative humidity data of Pune Division had been taken from Global Weather Data website of the period of 1979 to 2013.

The collected secondary data were processed by using different statistical and quantitative techniques for getting correct results. During the investigation various methods were used satisfy the objectives.

The climatic parameter such as temperature trends were processed by using MS- Excel Windows office 2010. To supporting present work researcher has prepared map with the help of GIS technique.

## 1.4 Relative Humidity

It is fundamental element for climatic conditions of the region because it controls the precipitation, radiation of the earth surface, temperature, latent heat, stability and instability etc. Humidity is an important indicator in the study of climate because the proportion of humidity in the air determines the climatic condition of a particular region. When the proportion of humidity in atmosphere is high then the climate of a particular region will be wet and when the proportion of humidity in atmosphere is less; the climate of that region will be dry.

Table No. 1.1  
 Monthly and Seasonal Relative Humidity in  
 Pune Division (1979 to 2013)

Sr. No.	Months/ Season	Relative Humidity (%)
<b>A. Monthly</b>		
1	January	42.14
2	February	34.42
3	March	31.04
4	April	34.51
5	May	45.27
6	June	73.09
7	July	85.12
8	August	87.68
9	September	83.63
10	October	69.12
11	November	56.5
12	December	46.75
<b>B. Seasonal</b>		
1	Winter	41.1
2	Summer	36.94
3	SW Monsoon	82.38
4	Post Monsoon	62.81
	<b>Annual</b>	<b>55.81</b>

Source: Global Weather Data in Pune Division (1979 to 2013)



The monthly trend of relative humidity is also showing monthly variation. The highest change in average relative humidity 87.68 per cent has recorded in the month of August followed that July and September shows the relative humidity are 85.12 per cent and 83.63 per cent respectively. The lowest change in average relative humidity 31.04 per cent has recorded in month of March (Table no. 1.1). The change in average relative humidity is seasonally variable from season to season.

The annual average relative humidity has recorded 55.81 per cent in Pune division. The SW Monsoon season has 82.38 per cent highest change in average relative humidity. It followed by the post monsoon season (62.81 %) and during the winter season it is reported 42.40 per cent change in average relative humidity. The lowest change in average relative humidity recorded in summer season which is 36.94 per cent (Table no.1.1).

The relative humidity in Pune Division (1979 to 2013) is decreasing with the rate of 0.74 per cent. In other words per annum decreasing rate of the relative humidity is 0.008 per cent. According to the fig. no.1.1 it is reported that the relative humidity was 58.79 per cent in 1979 and in last year 2013 it is 59.24 per cent as well as it is highest recorded 63.07 per cent in the year 1990 and the lowest 53.38 per cent in 1992.

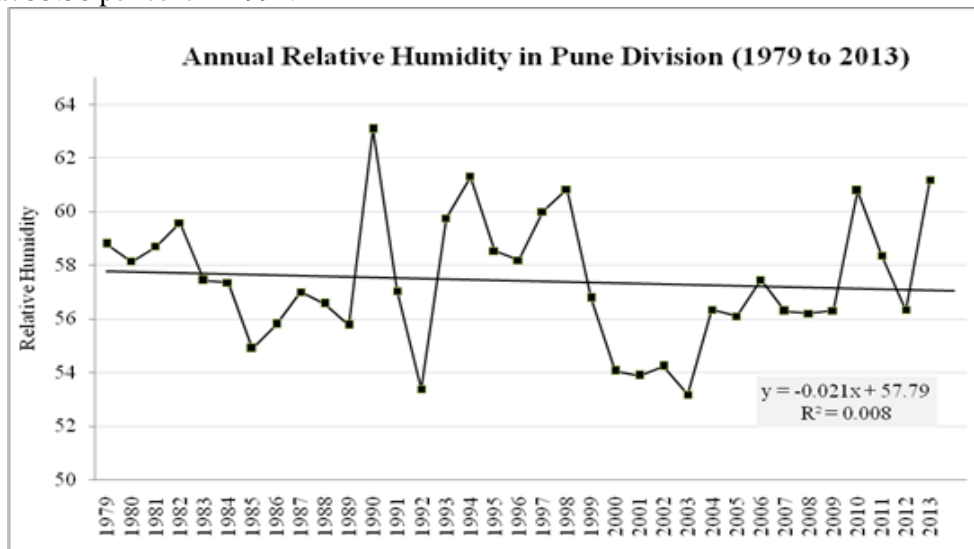


Fig. 1.1

According to the fig. no.1.2 clearly reveals that the relative humidity pattern is varying in the considered 35 years. An average decrease in relative humidity is reported by 0.63 per cent. The considered initial period (1979-83) and last years (2009-13) are indicating equal relative humidity which is 58.69 per cent from change in average relative humidity. It is maximum recorded (59.76 %) in 1994-98, followed that 1979-83, 2009-13 and 1989-93 by 58.52, 58.69 and 57.80 per cent respectively. Such change in average relative humidity trend brightly indicating above the average relative humidity in study region. On the other hand the periods such as 1984-88, 1999-03 and 2004-08 shows the change in average relative humidity by 56.32 per cent, 54.52 per cent and 56.47 per cent respectively.

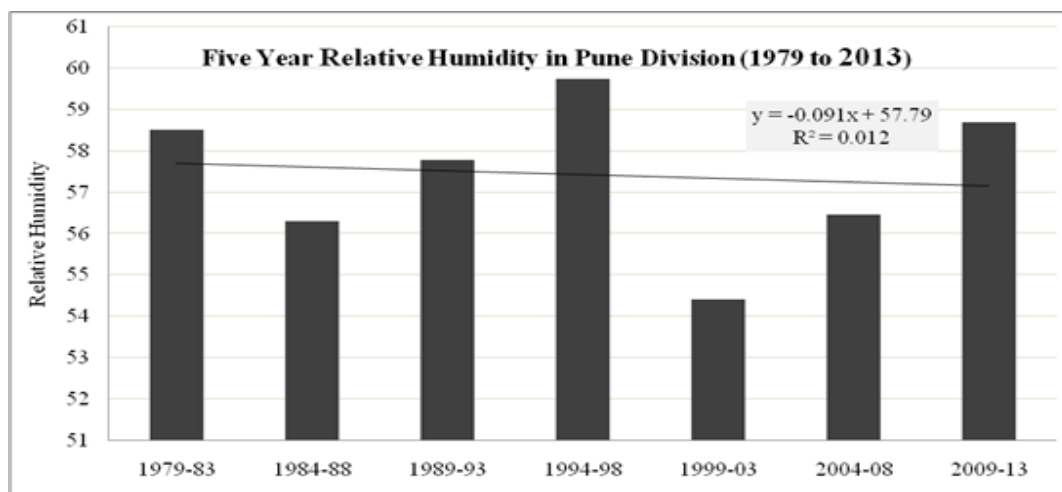


Fig.1.2

For the study of relative humidity in Pune division the period between 1979 to 2013 (35 years) has taken into consideration. It is found that monthly average relative humidity noticed highest i.e. 87.68 per cent in August and lowest i.e. 31.04 per cent in March. Highest seasonal relative humidity observed during South-west monsoon period, it remains at average level during post-monsoon period and lowest in summer season.

### Conclusion

Temperature plays a significant role in the proportion and distribution of humidity in atmosphere. The proportion of humidity is always high during rainy season and low in summer season in Pune division. As far as annual relative humidity is concerned it is found that there is decreasing trend in it due to increasing temperature and variations in the proportion of rainfall. During the last 35 years annual average relative humidity is decreased from 58 per cent to 57 per cent in Pune division.

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## Causes of Dange Tribal in-Migrants in Kolhapur City, Maharashtra

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### Abstract

*Migration is known as the movement of people from one permanent residence to another permanent or temporary residence for a large period of time. The migration is considered to be purely economic but the other factors like physical, social, political, psychological also have some bearing. In true sense, it is the collective impact of all these factors. During the last 60 years, the Dange tribals have been migrating to Kolhapur city. In the first phase of migration Chh. Shahu Maharaja presented a land to Danges at Kadamwadi. The present paper attempts to analyze the causes of Dange tribal in-migrants in Kolhapur city, Maharashtra. Causes of Danges are found in the two types i.e. push and pull factors.*

*The study is based on primary data, generated through intensive field surveys. The relevant data has been collected for the three different periods taking into consideration the in-migration of Danges in the city i.e. before 1975, 1975-1995, 1995-2015. It is found from the study of causes of Dange in-migrants shows in their original habitat have been struggling with the number of problems and difficulties which pushed Danges to the city.*

**Keywords:** Migration, Residence, Dange, Intensive, Struggling

### I. Introduction

Migration is an important component of population change. Migration is known as the movement of people from one permanent residence to another permanent or temporary residence for a large period of time. The dictionary definition of the verb 'to migrate' is to move from one place (country, town and house) to another. Recently, geographers have been concerning themselves with population dynamics and the problems associated with migration (Husain, 1994).

Migration cannot be considered the mere shift of people from one place of residence to another, as it is most fundamental to the understanding of continuously changing space content and space relationship of an area (Gosal, 1961). The reasons and purposes of migration are changing in the course of time. The reasons behind modern migrations are associated with the sources of livelihood, employment opportunities, education, recreational facilities etc. Migratory movements are basically a product of social, cultural, economic, political or physical circumstances in which individuals or groups find themselves safe (Bhende and Kanitkar, 2000).

The migration is considered to be purely economic but the other factors like physical, social, political, psychological also have some bearing. In true sense, it is the collective impact of all these factors. Dange life in the Western Ghat region has been controlled mainly by the physical environment. Their mode of life has also been associated with the many problems. But during the course of time with the changing physical, biological, socio-economic and political, environmental conditions, a number of problems have been emerged out, leading to the question of their survival which compelled them to migrate elsewhere. The investigator has tried to discuss and examine the causes of Dange migration.

### II. Study Area

- The study area, undertaken for the present study, is Kolhapur city, a district head-quarter. (Figure-1)
- There are 33 locations where the Danges have been concentrated in the city. The total population of in-migrant Danges in the city is approximately 8280, distributed among 1066 households.

### III. Objective

The main objective of the present work is to analyze the causes of Dange tribal in-migrants in Kolhapur city.

### IV. Database and Methodology

Since no secondary data, pertaining to Danges at the place of origin and destination are available, the present work is mainly based on primary data which is generated through field surveys. Out of 33 Dange in-migrant locations (1066 families) in the city, 25 have been selected randomly for

sampling. The relevant data has been collected for the three different periods taking into consideration the in-migration of Danges in the city i.e. before 1975, 1975-1995, 1995-2015. Out of the total in-migrated families (1066), 320 families have been selected randomly for different periods of their migration.

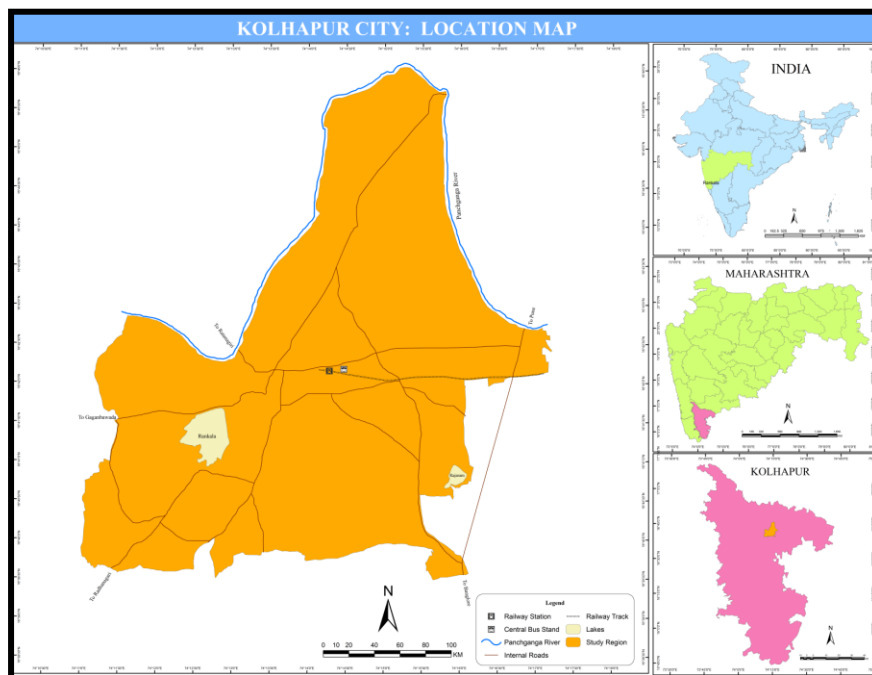


Figure 1

## V. Discussion

### Causes of Dange Migration

People generally migrate from the 'problem region' to the 'answerable region'. Danges also experienced several difficulties at their original places. In view of this, the investigator collected the information about the causes of their migration from their original habitat. These causes of migration are grouped into two factors as push factors and pull factors. The push factors of Dange migration mainly include the lack of basic facilities in their original habitat like education, transport and communication, poor housing, rain-fed agriculture, reducing collection of forest products, scarcity of drinking water and health, etc. These causes are summarized as follows:

#### A) Dange Migration-Push Factors

The life of Danges in the Western Ghats region has been mainly controlled by physical environment. Dange society in such forested land has been isolated, self-reliant and autonomous body with very limited needs. During the course of time with the changing physical, socio-economic, political and biological conditions, numbers of problems have been emerged out leading to the question of their survival which has forced them to migrate.

##### 1. Lack of Educational Facilities

The Danges, from the recent past, have been aware of the importance of education. But their original habitat faces the backwardness of educational facilities mainly due to the physical constraints. In the original habitat comprising to Jambhali, Kumbhi and Dhamni river basins, it is found that only 60 percent Dange villages have pre-primary schools and 40 percent villages are totally deprived of any school facility (Ajagekar, 2002). The villages which have pre-primary (1<sup>st</sup> to 4<sup>th</sup> standard) schools are 'single-teacher' schools. It is also observed that the opening of pre-primary schools popularly known as '*wasti shala*' is very recent (Photo Plate). It is found that the adult Danges migrated before 30 to 35 years are totally illiterate.

The education above the pre-primary level for Danges remains a dream because the Dange pupils have to cross a long distance to acquire the education above pre-primary level. It is observed during the survey that no primary school (5<sup>th</sup> to 7<sup>th</sup> standard) is available in any of the Dange habitation in their original habitat. The availability of the facility of primary school, high school and

higher level schools in the region is at an average distance of 2 km, 5 km, and 7 km respectively. The high school facility for Padsaliwada in Jambhli basin of Panhala tehsil is at a distance of 25 km. Therefore, such a long distance through forested and hilly terrain is not negotiable to the children particularly in the months of rainy season.

Such poor situation of educational facilities has shown in the table 1. In this table two sampled Dange habitations at different tehsils have taken as an example to show the educational condition.

**Table 1: Distance between the Sampled Dange Original Habitations and School Level**

Sampled Dange Habitations	Situation Period	School Level and Distance From the Habitation (In km)			
		Pre-Primary and Primary	High School	Junior College	Senior College and Other
Kawaltekwada	Before 1980	06	10	45	45
	2010	0.100	10	10	15
Nandariwada	Before 1980	10	15	55	55
	2010	0.500	08	15	15

Source: Fieldwork, 2015

The Kawaltekawada and Nandariwada are the two different Dange habitations in the hilly tracts of Gaganawada and Shahuwadi tehsils respectively. Table 1 show that the availability of educational facilities at both Dange villages is very poor. Before 1980, the distance of primary school at Kawaltekawada was 6 km and at Nandariwada it is 10 km which was not negotiable to the children. It means that no primary school facility was available in the villages themselves.

The distance of high-schools, Jr. College and other educational institutes from these villages show greater distance before 1980. The situation has changed in the year 2010 where in Kawaltekawada the primary school facility was made available but surprisingly the families started migrating towards Kolhapur. In 2015, the investigator observed in the field survey that 95 percent families have left the village and migrated to Kolhapur and the school building without pupils is left there (Photo Plate).

## 2. Lack of Transport and Communication

The good transport and communication system has an important bearing on the development of any region. Due to the hilly, sloppy, undulating and hence inaccessible terrain, the Dange villages are very poorly linked with rest of the areas which has been kept them to very much isolated and backward. The metaled roads cross the lowland areas of the basin and the Dange villages on the upper hills on both sides of the river basins are connected only with the footpaths.

The irrigation department has constructed roads up to the irrigation projects in the basins which provide transport facility to the Dange villages to some extent. It is found in the survey that no Dange village in such basins has been connected by road (Photo Plate). This situation has adversely affected the health and education of Danges.

## 3. Rain-fed Agriculture

Agriculture is not the main occupation of Danges. It is practiced as subsistence, subsidiary and traditional agriculture. It is totally rain-fed and the cropping pattern is monoculture, dominated by *nachani*.

The investigator observed in the field visit in the Dange habitat, a thin soil cover, less use of fertilizers, sloppy land, use of traditional farm implements, growing of inferior millets and total dependency upon rainfall. In such situation Danges collect very little grain and may not get sufficient food (Photo Plate).

## 4. Problems Related to Livestock

Livestock has been the main source of livelihood of Danges. It consists of buffaloes, cows, bulls and goats (Photo Plate). By selling such animals the Danges have been earning money for their



livelihood. During the last 4-5 decades, their livestock occupation has been facing a number of problems. The investigator made an inquiry with in-migrated Dange people and the Danges reported the following problems regarding the livestock occupation.

1. The scarcity of fodder to their animals becomes acute due to the deforestation and large scale deterioration of vegetation in the Dange habitat.
2. The region has been facing an acute shortage of water for their animals particularly during dry summer.
3. Because of the cutting of forest on large scale, the attacks of wild animals on the domesticated animals of Danges have been increasing.

Such big and major problems put the livestock occupation of Danges in danger which has destroyed their economy and further their subsistence.

## 5. Poor Housing

Housing is the basic need of human being but relatively a good house for Danges has remained a dream. The housing conditions of Danges in the basins are very poor. They are thatched, mud-walled and tiled houses (Photo Plate). It is observed that the government has provided funds for housing through 'Indira Awas Yojana' to these poor Danges in recent past but the Danges are not satisfied with such small funds and quality of construction of houses.

At the time of a field survey the investigator made an inquiry of the in-migrated sampled Dange households regarding their housing conditions at their destination in the past. The information thus derived is shown in the table 2.

**Table 2:** Housing Conditions of Dange Households before Migration

Period of Migration	Housing Conditions and Number of Households				Total
	Thatched	Kachha	Semi-Pacca	Pacca	
<b>Before 1975</b>	51 (62.19)*	30 (36.58)	01 (01.21)	00	<b>82</b>
<b>1975-1995</b>	44 (43.13)	56 (54.90)	02 (01.96)	00	<b>102</b>
<b>1995-2015</b>	54 (39.70)	78 (57.35)	03 (02.20)	01 (0.73)	<b>136</b>
<b>Total</b>	<b>149 (46.56)</b>	<b>164 (51.25)</b>	<b>06 (01.87)</b>	<b>01 (0.31)</b>	<b>320</b>

Source: Fieldwork, 2015

\* Figures in bracket indicate percentage to total households

Table 2 reveals that 51.25 percent households had *Kachha* houses followed by 46.56 percent thatched houses. Only 2 percent houses were in the semi-pacca and pacca category. It is further found that the housing conditions of Danges were very poor who are in-migrated before 1975. The housing conditions are found relatively improved in the further periods of migration of Dange families.

## 6. Problems in the Collection and Sale of Minor Forest Produce

The collection of minor forest produce (MFP) is another forest-based activity of Danges in their original habitat. The MFP includes fuelwood, fruits, honey, spices, gum, grass, medicinal products for which the forests in the Dange habitat are rich (Photo Plate). The collection of all such commodities from the surrounding forests, provide them with the food for their consumption and employment and earn money by selling such commodities in the market. The migrated Danges reported that from the recent past the people at their destination have been facing number of difficulties and problems in the collection of forest products.

### The main problems are-

1. The villagers from the lowland areas are encroaching in the forests to collect and sale such type of MFPs.
2. The forest contractors purchase the forest commodities by Danges at a very cheap rate.
3. The quality and quantity of forest products has been declining due to the large scale of deforestation in the Dange habitat.

Due to such situation, Danges in the basins have been gaining very less as compared to the past which has direct impact on their livelihood.

### 7. Scarcity of Drinking Water

The original habitat of migrated Danges stands as the highest rainfall receiving (3000 to 6000 mm) region of Kolhapur district. The region has ample water for domestic and drinking use from June to February. But the Danges on the hills faces acute shortage of water for drinking and for their animals during the dry summer season. In the past, the springs were perennial which are getting dry in summer months. Today, this has adversely affected their main livestock occupation which has further created a problem of their survival. In the field survey the investigator inquired with the sampled households about the availability of drinking water facilities at their original habitat. The information thus collected is shown in table 3.

**Table 3:** Drinking Water Sources of Dange Households before Migration

Period of Migration	Drinking Water Sources and No. of Households				Total
	Spring	River	Well	Hand Pump	
<b>Before 1975</b>	54 (65.85)*	12 (14.63)	06 (07.31)	10 (12.19)	<b>82</b>
<b>1975-1995</b>	62 (60.78)	16 (15.68)	11 (10.78)	13 (12.74)	<b>102</b>
<b>1995-2015</b>	77 (56.61)	23 (16.91)	19 (13.97)	17 (12.50)	<b>136</b>
<b>Total</b>	<b>193 (60.31)</b>	<b>51 (15.93)</b>	<b>36 (11.25)</b>	<b>40 (12.50)</b>	<b>320</b>

Source: Fieldwork, 2015

\* Figures in bracket indicate percentage to total households

Table 3 indicates that there was dominance of traditional sources of drinking water. The Danges in-migrated in all the three periods mentioned in the table responded that the traditional spring water source was the dominant (60.31 %) followed by natural river water source (15.93 %), (23.75 %) well and hand pump source of drinking water.

### 8. Poor Health Care Services

The poor health condition is another serious problem of Dange tribal. The traditional customs, ignorance, poverty of Danges, topographical constraints and distant health-care services from their villages, have badly affected their health. The inquiry among migrated Danges in Kolhapur city reveals that the herbal treatment, in the past, was the only source in their original habitat. Recently, they have been taking allopathic treatment from PHC which provide cheap medical services. Since, the Danges being forest dwellers cannot get the benefits of distant PHCs.

The inquiry among migrated Danges from Kawaltekwada and Nandariwada villages reported the health care situation at their destination. The poor Danges can afford the cheap services of PHCs. The information shows in table 4.

**Table 4:** Distance between the Sampled Dange Original Habitations And Primary Health Care Centers

Sampled Original Dange Habitations	Situation Period	Distance (In km)	
		PHC	Rural Hospital
<b>Kawaltekwada</b>	<b>Before 1980</b>	15	27
	<b>2010</b>	6	15
<b>Nandariwada</b>	<b>Before 1980</b>	15	35
	<b>2010</b>	10	20

Source: Fieldwork, 2015

Table 4 reveals that the distance between the PHC and original Dange habitations was more about more than 10 km before 1980. To get good facilities of health from rural hospital the people had to cross more than 25 km of distance. A migrant Janu Bajari from Padsaliwada (Panhala tehsil) reported that he had to get services of PHC at a distance of 35 km (Bajarbhogav PHC).

These problems discussed above are interlinked with each other. They disturbed the self-reliant, traditional and forest-based economy of Danges which forced them to be the wage-labourers. The Danges started searching jobs in surrounding areas. Some have accepted the seasonal migration and others the out migration to the various locations like Mumbai, Kolhapur, Dharwad district in Karnataka state etc. permanently.

## B) Dange Migration- Pull Factors

Due to various problems in the original habitat as discussed earlier, Danges have been out-migrated. The Danges have in-migrated to Kolhapur city for various reasons. These pull factors have been discussed in the following points:

### 1. Policies of Shahu Raja

Chh. Shahu Maharaja in *Kolhapur Sansthan* was a great social reformer in the history. He provided number of opportunities and made efforts for the upliftment of the weaker sections of society. He made available open land at Kadamwadi for Danges as he was well aware of the hardships and difficult life of Danges in the forests.

Wagu Kokare, in-migrant in Kadamwadi reported that-‘some Danges had very good knowledge of medicinal plants and they were practicing as *‘Vaidu’*. In the same way the young and strong Danges were practicing *masaj*. Shahu raja had given protection to such Danges in his *sansthan*. Therefore, the Danges attracted to Kolhapur city.

### 2. Better Education Facilities

The Danges were deprived of educational facilities in their original habitat. In course of time they realized the importance of education. Danges decided to take benefits of better educational facilities in Kolhapur city. It is found in the field survey that 96 percent adult Danges are happy as they are providing education to their children. 75 years old Vithu Kathrat from Laksirth colony reported-

“I could not provide education to my children as they had stick in their hands to rear the animals in spite of having pencil but my grandsons here are learning at schools.”

### 3. Employment Opportunities

The availability of various employment opportunities in the city attracted to Danges who were fighting for their survival in their original habitat. The city opened various opportunities to earn money. Not only males but the females also are earning money. It is found from the sampled survey that 98 percent working population is engaged in any kind of work. Ramu Bodake from Bondrenagar reported-

“We were tired of the problems and difficulties in our original habitat. We were ready to carry any kind of job in the city. Therefore, we have accepted varied occupations and we succeeded in those”.

### 4. Nearness of Original Habitat from City

The Danges decided to migrate to city Kolhapur which is not far away from their homeland. The distance between the homeland and the city ranges from 45 to 80 kms. Biru Gawade from Fulewadi reported-

“I can visit to my native place to participate in the festivals and ceremonies or to visit *Gav Pandhari* (Local God) and to the relatives. Therefore, I do not feel unhappy”.

The above main factors attracted Danges to settle down in Kolhapur city.

## VI. Conclusion

Dange, a pastoral (nomadic) tribe, is in-habited in geographically contiguous area of Western Ghats. During the last 60 years Danges in their original habitat have been facing a scarcity of forest resources as their main source of livelihood which has posed serious problems of their survival. Therefore, the Danges have been migrating towards the cities and the agriculturally reach areas in Maharashtra. In the same way they are migrating to Kolhapur city.

The present study is an inquiry of Dange in-migrants in Kolhapur city who are primarily migrated from Jambhali, Dhamni and Kumbhi basins which are narrow, isolated, forested and located at a distance of 80-120 km to the west of Kolhapur city. This is an attempt to study as to how Danges have adjusted themselves with the new city environment which is totally different from their original habitat.



Danges in their original habitat have been struggling with the number of problems and difficulties which pushed Danges to the city. The push factors as the causes of migration comprises mainly the lack of educational and transport facilities, poor housing, rain-fed agriculture, poor health care services, scarcity of drinking water and problems related to the collection of forest products and their livestock.

The better education facilities, employment opportunities, nearness of the original habitat and protection provided by Shahu Maharaja have been the main causes of attraction of Danges to the city.

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### PHOTO PLATE



## Organic Farming In India : Status, Issues And Challenges

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### Abstract:

*Organic farming is being done in 179 countries in total of countries by the green evolution in country modern farming instrument seeds, chemical product in this reason increase and crop product and fertilizer the land but another way created Environment problem and it is affected on human body by the Erosion of soil decrease the fertilization land decrease the water level and the crop produced is low category the crop these all modern thing unaffordable to common farmer in fact increase uncertainly in farming. Therefore on the world level discover alternative to modern farming and that is organic farming some of country leads towards farming the organic farming than have started to do organic farming. It is method of farming It is beneficial not only protect the land and avoid the soil erosion but also the crop having a standard the modern farming. Which land is farming by the modern equipment that unable to give standard before the India's. Trad mark AGMARK and FAo rejected the crop which crop deserves move use that is why in present for mereasing the crop with standard the people take a each on the organic farming in the reason india produces a large variety of crops including cereals, pulses and oilseeds, in the name of increased productivity, indiscriminate application of enormous quantity of chemical fertilizers is being followed keeping the health factor at bay. Hence an alternative method of farming is of argent need which could satisfy the needs of increased food production as well as providing a security against any potential health problem organic farming has been proved as a solution to both of these problems. This article focus on organic forming in India: Status, issues and challenges.*

**Keywords:** Organic farming: Status, Issue, and challenge, principles.

### Introduction:

Agriculture is the backbone of the Indian Economy according to the census 2011 of 68.84% population living in rural area. 58% of population depends on agriculture. The share of primary sectors including agriculture, livestock, forestry and fishery is estimated to be 20.4% percent of the gross value added GVA during 2016-17 at current prices. By the green evolution in county modern farming instrument seeds chemical product in this reason increase and crop product and fertilizer the land but another way created environment problem and it is affected on human body. By the Erosion of soil decrease the fertilizations land decrease the water level and the crop produced is low category the these all modern thing unaffordable to common farmer in fact increase uncertainly in farming. Therefore on the world level discover alternative to modern farming and that is organic farming some of country leads towards farming the organic farming than have started to do organic farming it is method of farming it is beneficial not only protect the land and avoid the soil erosion but also the crop having a standard the modern farming which land is farming by the modern equipment that unabe to give standard before the India's trademark AGMARK and international Trademark FAo the international market is rejected the crop which crop deserves move use or chemical own antiseptic that is why in present for mereasing the crop with standard the people take a each on the organic farming in the reason I have done research organic foarming inIndia status , Issue, and challenges.

### Concept of organic farming:

According to the IFOM organic farming is production system the sustain the health of soils. Ecosystem and people it relies on ecological processes, biodiversity and cycles adopted to local conditions, rather than the use of inputs, with adverse effects organic forming combines tradition incrition own science to benefit the shared environment own promote fair relationships and a good quality of live for all involved.

### Definiation of organic farming:

Organic farming is a method of crop and livestock production that involves much more than choosing not to use pesticides, fertilizers, genetically modified organism, antibiotics & growth hormones.



**Review of literature:**

Several studies related with different aspects of organic farming.

1. KiKani B.K. (2007), Studied "Limitations of microbial technology for organic farming". He studies that the rural Economy is facing a challenge of over dependence on synthetic input on the increase the price of these inputs further the Indian agriculture face the market competition due to the globalization of trade.
2. Gahukar.R.T. (2006) He studied "Potential and use of bio fertilizers in India, present paper stated that, Bio -fertilizer are natural and organic products they help to provides and keep in the soil all the materials and micro-organism required for the plain growth.
3. Kokate K.D. (2007): His studied "social Aspects and challenges of organic farming".He has highlights on social and benefits arising from organic farming as the also studies the challenges of organic farming.
4. Sari. V.K. (2007): his studies "Scope of commercialization of Indigenenous technology for organic farming he studies in his paper that wast materials organic farming presently using a variety of other local product to meet nutritional requirement of crops and protect than against past with a good measure of success.

**Objectives:**

1. To study the an organic farming stutes, Issuse and challenges in India.
2. To study the principles of an organic farming.

**Research methodology:**

The paper is based on secondary data nformation and collected from the published sources like the websits, books, EPW, Newspaper, artcils, margins, and thesis of the research papers etc.

**Present status of organic Farming: A world view (2017):**

According to the lotest FIBL survey on cetified organic farming world wide as of the end of 2015, data on organic farming was available from 179 countries (172 in 2014)

There were 50.9 million hector of organic Agricultural land in 2015. Including in conversion areas. The regions with the largest areas of organic Agricultural land are oceania (22.8 million hec. which is almost 45 percent of the world's organic Agricultural and Europe (12.7 million hec. 25 percent) Latin Americal has.6.7 million hec. (13 percent) followed by Asia (4 million hectorytt 3 percent.) The countries with the most organic Agricultural land are Australia (22.7 million hec.) Argentina (3.1 million hec.) and united states (2 million hec.)

Currently one percent of the world's Agricultural land is organic. The highest organic shares of the total Agricultural land by region are in Oceania (5.4 percent) and in Europe (2.5 percent) in the European union 6.2 percent of the Farmland is organic However some countries reach for higher shares Liechtenstein (30.2 percent) and Austria (21.3 percent). In eleven countries 10 percent of the Agricultural land or more is organic. It was reported that there were almost 6.5 million hectores more of organic Agricultural land in 2015 than in 2014 this is mainly because 4.4 million additional hectores were reported from Australia However many other countries reported an important increase thus contributin to the global growth such as the united state (30 percent increase) and India (64 percent increse) both with an additional 0.5 million hectos and spain and france, both with an additional 0.3 million hectores. There has been an increase in organic Agricultural land in all regions with the exception of Latin, America, in Europe, the are grew by almost 1 million hectores (8.2 percent increase) in Africa the Area grew by almost 33.5 percent in Asia, the area grew by 11 percent or almost 0.4 million hectores and in North America by more than 21 percent or over 0.5 million additional hectores. There were almost 2.4 million producers in 2015 Thirty five percent of the world organic producers are in Asia, followed by Africa 30 percent and Latin America 19 percent the countries with the most producers are India (585200) Ethiopia (203602) and Mexico (200039). There has been an increase in the number of producers of over 160000.

Organic Agricultural land (including in conversion areas and regions shares at the global organic Agricultural land 2015.)

**Table 1.1**

Region	Organic Agricultural Land (hecteres )	Regions share of the global organic a land
Africa	1683482	3%
Asia	3965289	8%
Europe	12716969	25%
Latin America	6744722	13%
North Ameica	2973866	6%
Ocenia	22838513	45%
<b>Total</b>	<b>50919006</b>	<b>100%</b>

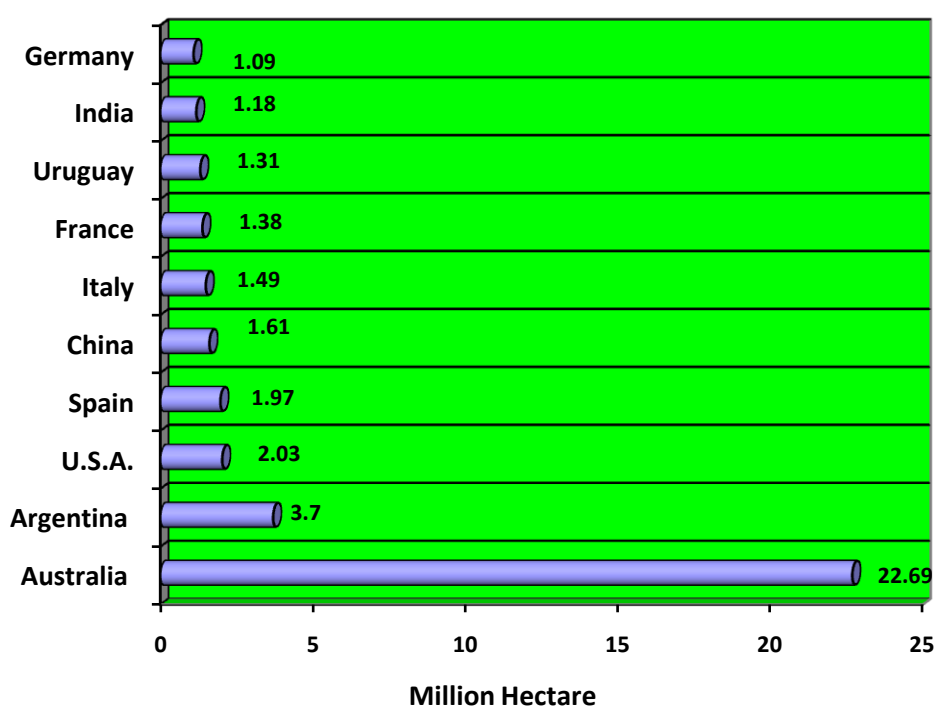
Source: FIBL- servey-2017

It is seen that from Table 1.1 the larest organic forming in the continent of ozenia is the lowest organic farming in Africa.

The Ten countries with largest area of organic Agricultureal land 2015.

**Table 1.2**

**Top 10 Countries with Largest Organic Agriculture Land: 2015**



Source: The World Organic Agriculture:Statistics and Emerging Trends 2017

### Organic farming in India:

Organic farming was practiced in India since thousands of year. In tranditioonal India the entire Agriculture was practiced using organic tehniques where the fertilizers and pesticides were obtained from plants and animals. At that time organic farming was backbone of Indian Economy India's achievement tin Agricultural production after the green revolution has been exemplary and mainly due to the increase use of inputs like fertilizers pesticides and farm machinery but scientist have realized that the green revolution with high input use reached a plateau and now is sustained with a plateau and now is sustained with diminishing return of falling dividends according to agriculture and processed food products expert development Authority APEDA ground 2.8 million

hecters of land was organic farms in 2007 which increase to 37.2 percent in 2011 further there are 15000 organic farms in India. therefore is on the most important supplier of organic food to the developed nations.

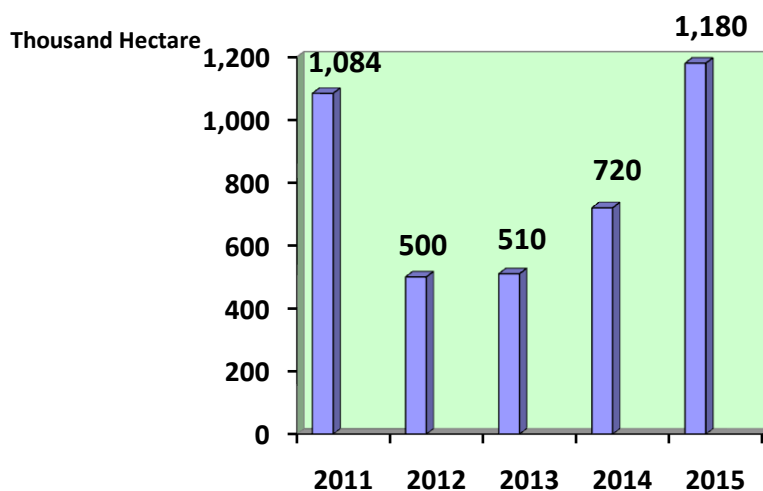
As per the latest available cross country statistics in the year 2015 India ranked first in terms of the number of organic producers among over 170 countries and Ten in terms of the area under organic Agriculture india has potential for export of organic products and was ranked 11<sup>th</sup> in organic product exported in 2015. key markets for India include developed countries such as the European union (EU), the united states (US) Canada, Switzerland, Japan and Australia developing countries such as Bhutan, middle Eastern countries such as Saudi Arabia, and member countries at the Association of Southeast

### Asian Nations (ASEAN)

Currently India Ranks 10<sup>th</sup> among the Top countries in terms of cultivation. The certified area includes 10% cultivable area with 0.50 million hectares and rest 90% (4.71 million hectares is forest and wild area for collection of minor forest products. The total area under organic certification is 5.21 million hectares APEDA 2013. India produced around 1.34 million Mt of certified organic products which includes all varieties of food products namely sugarcane, cotton, Basmati rice, pulses, Tea, Spices, coffee, oil seeds, fruits, and their value added products. The production is not limited to the edible sector but also produces organic cotton fiber, functional food products etc (APEDA, 2013) Among all the states, Madhya Pradesh has covered largest area under organic certification followed by Rajasthan and Uttar Pradesh, in India Madhya Pradesh has highest area under organic farming (1.1 Mha or 52%) Maharashtra is at second (0.96 mha or 33.6% and Orissa is at third (0.67 mha or 9.7%).

### Indian organic Agricultural land: 2011-2015

The over view of organic farming in India is show as follows.

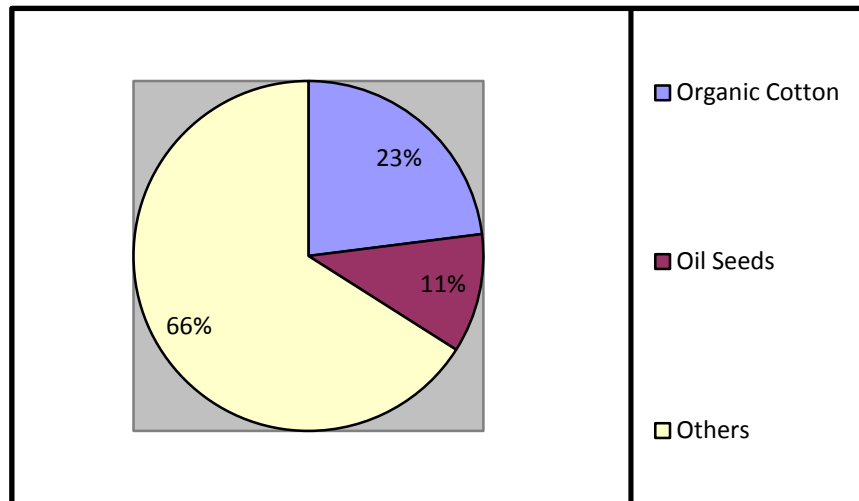


Source: The World organic Agriculture: Statistics and Emerging Trends 2017 & 2013.

It is seen that from graph in 2011 there was 1084 hectares of organic farming as well as 533 organic farming in 2012 in 2011, 1084 hectares of organic farming was being done, as against 500 hectares of organic farming in 2012 and 720 in 2014 and 1180 in 2015 this indicates that organic farming hectares are showing decline in growth.

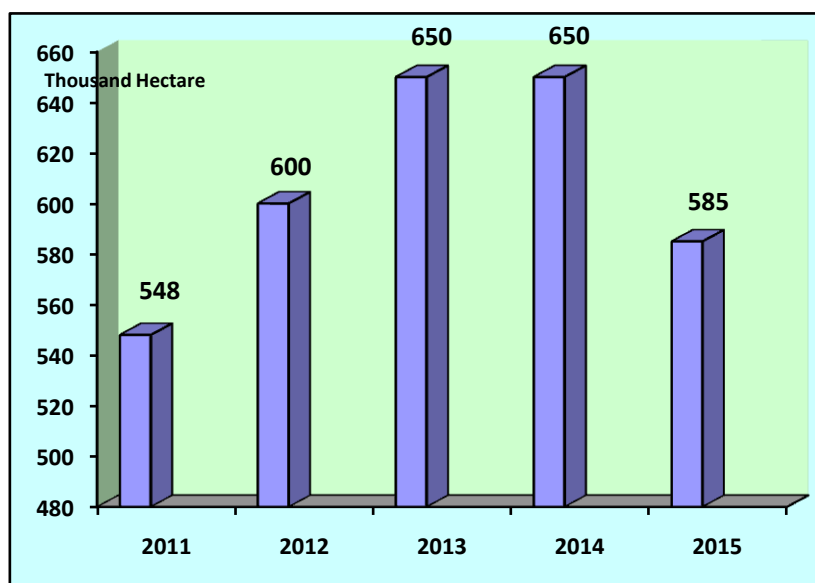
### 2.2 Indian organic Agricultural land by crops: 2015

A review of which crops are cultivated below organic farming in India is as shown below (2015)



Source: The World organic Agriculture: Statistics and Emerging Trends 2017 & 2013.

It is seen that from cercal graph, out of the total cultivation 23% organic production of cotton is produced. 11% of oil seeds is produced and percent production is grown through other crops it shown that organic farming is done through different crops in India.



### 2.3 Indian organic producers: 2011-2015:

The review of organic farming farmers in India are as follows

Source: The World organic Agriculture: Statistics and Emerging Trends 2017 & 2013.

It is seen that from bar graph in 2011 there were 548 farmers of organic farming and in 2013 there were 650 farmers in 2015, 585 farmers have seen organic farming . It shown that the increase in farming has decreased

## 2.4 State wise area in ha under organic certification (including wild harvest) 2011-12.

Name of States	Area (ha)
Andhra Pradesh	47456.77
Arunachal Pradesh	520.43
Assam	2048.27
Andman	0
Bihar	188.6
Chhattisgarh	299970.6
Delhi	100238.7
Goa	153684.6
gujarat	41978.94
Haryana	17442.36
Hinachal Pradesh	933798.2
J&K	26834.26
Jharkhand	29794.42
Karnataka	118739.7
Kerala	15790.49
Lakshadweep	891.93
Madhya Pradesh	432129.5
Mahrashtra	245339.3
Manipur	1296.91
Meghalaya	288.23
Mizoram	7023.97
nagaland	7762.6
Orissa	43868.18
Punjab	927.28
Rajasthan	222319.1
Sikkim	25716.55
TN	38554.33
Tripura	4.05
UP	2593821
Uttarakhand	122880.6
West Bengal	19095.55
<b>Total</b>	<b>5550405</b>

Source : APEDA -2011-12

It is seen that from table, the highest organic farming is done in Himachal Pradesh, After which the five states of Madhya Pradesh, Uttar Pradesh, Maharashtra, Rajasthan organic farming is done in these five states, organic farming is not done in the Andaman state, Tripura, Bihar, Arunachal Pradesh, Punjab, Lakshadweep, etc. have low organic farming in the state.

### The Principles of organic farming.

The principles of organic farming serve to inspire the organic movement in its full diversity the four principles of organic farming are as follows.

#### 1. Principle of health:

Organic farming should sustain and enhance the health of soil, plant, animal, human and planet as one and indivisible. This principle points out that the health of individuals and communities cannot be separated from the health of ecosystem healthy soils, produce healthy crops that faster the health of Animals and people. Health is the wholeness and integrity of living systems organic farming is intended to produce high quality, nutritious food that contributes to preventive health care and well being in view of this it should avoid the use of fertilizers, pesticides, animal drugs and food additives that may have adverse health effects.

#### 2. Principle of ecology :

Organic farming should be based on living ecological system and cycles work with them, emulate them and help sustain them. The principle roots organic farming within ecological system. It states that production is to be based on ecological processes and recycling, organic farming should attain ecological balance through the design of farming system organic products should protect and benefit the common environment including landscapes, climate, habitats biodiversity, air and water.

#### 3) Principle of Fairness:

Organic farming should build on relationship that ensure fairness with regard to the common environment and life opportunities fairness is characterized by equity respect, justice, and stewardship of the shared world both among people and in their relations to other living beings organic farming should provide everyone involved with a good quality of life and contribute to food sovereignty and reduction of poverty.



#### 4) Principle of care:

Organic farming should be managed in a precautionary and responsible manner to protect the health and wellbeing of current and future generations and the environment organic farming is a living and dynamic system that responds to internal and external demand and conditions practitioners or organic farming can enhance efficiency and increase productivity but this should not be at the risk of jeopardizing health and well being organic farming should prevent significant risks by adopting appropriate technologies and rejecting unpredictable ones.

#### Issues and Challenges:

The Issues of organic farming are as follows.

##### 1. Lack of Awareness :

It is a fact that many farmers in the country have only vague ideas about organic farming and its advantages as against the conventional farming methods use of bio- fertilizers and bio -pesticides requires awareness and willingness on the part of the farming communication knowledge about the availability and usefulness of supplementary nutrients or enrich the soil is also vital to increase productivity Today Indian farmers do not have awareness about organic farming Therefore, organic farming is not as well developed.

##### 2) Output marketing problem:

It is found that before the beginning of the cultivation of organic crops, their marketability and that too at a premium over the conventional produce has to be assured in India there is not enough market available for organic farming organic farming also does not have the right gains. Therefore it is a major problem in front of organic farming.

##### 3. Shortage Bio- Mass:

Many experts and well informed are not sure whether all the nutrients with the required quantities can be made available by the organic materials, Even if these problems can be surmounted, they are of the view that the available organic matter is not simply enough to meet the requirements in India organic farming is not being properly stocked Therefore organic agricultural goods do not get the right price.

##### 4) Marketing problems of organic Inputs:

Bio fertilizer and bio pesticides are yet to become popular in the country. There is a lack of marketing and distribution network for them because the retailers are not interested to deal in these products as the demand is low. The Erratic supplies and the low level of awareness of the cultivators also add to the problem market is not available for organic farming even today so this is a major problem facing organic farming.

##### 5) Lack of financial support:

The developing countries like India have to design a plethora of national and regional standards in tune with those of the developed countries. The adoption and maintenance of such regulatory framework and its implementation will be costly while organic farmers face financial problems as farmers are not financially viable Indian government does little to help financially promote organic farming Even if not helped its implementations is not well organized so financial support is a major problem with organic farming.

##### 6) Low production:

In many cases the farmers experience some loss in yields on discarding synthetic inputs on conversion of their farming method from conventional to organic Restoration of full biological activity in terms of growth of beneficial insect populations, nitrogen fixation from legumes, pest suppression and fertility problems will take some time and the reduction in the yield rates is the result in interregnum It may also be possible that. It will take years to make organic production possible on the farm.

##### 7) Lack of Export:

The demand for organic products is high in the advanced countries of the west like USA, European union and Japan The export of organic farming goods to India is relatively low compared to other countries.

**Challenges:** The challenges facing organic farming are as follows.

**1. Profitability is low because food prices are low and land is expensive:**

Most of the farmers I know have a day job to support the farming they do on nights and weekends despite increase exposure small farms have gained in recent years. The reality is that most are still not profitable businesses production costs are high during organic farming but organic farming is reduced because of which farmers cannot afford organic farming that is the cost of production and the reduction in benefits is a challenge against organic farming.

**2. Farming organically on an industrial scale is difficult :**

Many organic crops are grown in monocultures, like conventional crops, but use organically registered pesticides and fertilizers. It is common for organic growers to spray pesticides even more frequently than their conventional counterparts to keep up with insect and disease pressure. Organic methods are much more effective on a small scale than on the industrial level.

**3. Organic certification is exclusive :**

Many small farmers don't justify the expense for organic certification some use methods that are very well suited for their production and environment but still don't qualify for the organic label. If you shop at farmers markets, you can talk to the farmer about how the food was grown.

**4. Lack of organic policy :**

The biggest challenge is the lack of an organic policy for the domestic market and imports in the absence of regulation on labeling standard for organic production and logo. It is not possible to distinguish an organic product from a conventional product if the right policy measures are taken, organic farming can grow at 20% over the next five years, leading to perhaps, doubling of farmers incomes over the years. Indian government should implement organic farming policy better so that the yield of the farmer will double.

**5. Lack of shortage food :**

There is a serious shortage of good quality organic inputs which increase the risk of loss of yield. The available organic for farmers are much below the required quantity and there are a number of spurious players in the market too similarly there is a shortage of good quality organic seeds some input companies have taken initiatives to go for third party certification lack of shortage food is big challenges before organic farming.

**6. Transportation challenges:**

Transporting the produce to the markets is another major challenge vegetable and fruits, which generally have very short shelf lives, make up a large part of the produce in India.

**7) There are many conflicting ideas of what organic means:**

Many consumers buy organic because it seems like ethical choice but now can big business grow organically and be any better than the produce grown in your own town. Is organic really synonymous with pure how do ethics of shopping local or fair trade? Perhaps we are ready for a new standard how about farm direct. In India, there are many challenges before farmers in organic farming that is there is no fair price for low productivity, financial difficulties do not provide subsidy on organic farming. There is not a special place in the international market there are many challenges before organic farming the government of India has to overcome those challenges.

**Conclusion:**

It is seen that the trend of organic farming in India is increasing. As organic farming is good for human life as well as health, organic fertilization is being done in 179 countries. The reason behind this is that after adopting green revolution in 1966, India was self-reliant in food grains in 1976 and since then attitude of looking at farming of people has changed and farmers started doing farming as profession so huge quantities of pesticides and chemical fertilizers started using industrial machinery and till a certain extent, food grains increased but its effects began to call for human health. If you want to make a better life for human life then organic farming seems to be necessary and today there is huge organic farming in India.

In the article has studied organic farming in India. status, issues and challenges this research has shown that Oceania is the largest organic farming in the continent it is also increasing the trend of organic farming in the continent of Europe, Asia, Latin America in the world India is the countries 10<sup>th</sup> largest organic producer similarly the highest organic farming in India is done in Himachal Pradesh after which the trend of organic farming in Madhya Pradesh, Maharashtra, Uttar Pradesh increasing

day by day. organic farming is not done in Andaman State in this research the study of the principle of organic farming is based on the principle that organic farming is a healthy condition but today also there are major problems facing organic farming that the lack of awareness of organic farming, lack of market low productivity low quantity export hope many problems have come before organic farming There are many challenges facing organic farming that is less productivity is given to lower prices of foodgrains, special grades are not given international farming. The government of India has to make efforts to overcome these challenges.

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## Diversification of agriculturists in rural areas of Belgaum District in Karnataka

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### Introduction

Agricultural development is the backbone of the development of India. The Indian population is mostly spread in villages and the main business of the people there is agriculture. Therefore, the rural development is becoming the need of the hour. The agriculture is becoming now a days a business of uncertainty. The poverty and unemployment are the results. Hence, the people in agriculture are following the diversification in their activities with the help of various schemes announced by the Government. The diversification has improved quality of life of rural areas. The rural development is the process leading to sustainable improvement in the quality of life of rural people especially the poor. The rural developmental programmes intend to reduce the poverty and unemployment, to improve the health and educational status and to fulfill the basic needs such as food, shelter and clothing of the rural population. Mahatma Gandhi also opined that the real strength of the country lies in rural people. To improve the conditions of rural people, Government of India launched some schemes through the planning commission of India such as Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), Rastriya Sama Vikas Yojana (RSVY), Indira Awas Yojana (IAY), Sampoorna Grameen Rozgar Yojana (SGRY), Integrated Tribal Development Project (ITDP), Pradhan Mantri Gram Sadak Yojana (PMGSY), Integrated Child Development Services (ICDS), Development of Women and Children in Rural Areas (DWCRA), etc. All these schemes are aimed to reduce the gap between rural and urban people which would help reduce imbalances and speed up the development process. The quality of life is the main aim of rural development. In India, out of total population of 121 crores, 83.3 crores live in rural areas (Census of India, 2011). Thus, nearly 70 per cent of the India's population lives in rural areas. More than 95% people out of this rural population is engaged in agriculture. These people are characterised by mass poverty, low levels of literacy and income, high level of unemployment, and poor nutrition and health status. In order to tackle these specific problems, a number of rural development programmes are being implemented to create opportunities for improvement of the quality of life of these rural people.

**Key words:** Rural development, Agriculture products, Rural University, Indian economy.

### Review of Literature

A.Chandra sekhara reddy, Dr. C. Anbalagan (2011)<sup>1</sup> stated that Agriculture and agro processing account for 30-60 % of GDP in developing countries. 63 percent of population lives in rural areas only. With rapid urbanization rural people depends mostly on agriculture. India started producing about 700 million tonnes (Mt) of biological materials per year including food grains, fruits, oilseeds, vegetables, milk, eggs, tea, coffee, fiber crops, forest produce and so on. Because of its socio economic impact specifically on employment and income generation, Agro processing is now regarded as the sunrise sector of the Indian economy. The common agro processing industries includes paper making units, hand pounding units for rice, bullock operated sugarcane crushers, water power driven flour mills, bullock driven oil ghanies, spinning wheels and handloom units for weaving etc. The rural areas are consuming a large number of industrial and urban manufactured products.

Santanu Panda, Arup Majumder (2013) have given many challenges posed by people in rural areas due to which the diversification in income earning process is sought. The challenges faced by the rural agriculturasts are :

1. No power to fix price of own products of agriculturists in rural area
2. Minimum support price not maintained in rural area
3. Developing rural areas is long time consuming process.
4. Most of the rural people depend on agriculture & that is a risky business.
5. Sustainable economic growth and diversification is required.
6. Government funding and institutional development are not informed.
7. Agricultural employment has started to decline.
8. Lack of appropriate technology & beneficiary participation.

### Profile of Study Area

The universe of the study is Belgaum district in Karnataka state. The city of Belgaum is the district headquarters in North Karnataka. It houses the second legislative building, where the

Karnataka Legislature will meet once a year. According to the 2011 Census of India, it has a population of 4,778,439 of which 24.03% live in urban areas, making it the second most populous district in Karnataka (out of 30), after Bangalore. The district has an area of 13,415 square kilometers, and is bounded on the west and north by Maharashtra state, on the north east by Bijapur District, on the east by Bagalkote District, on the south east by Gadaga District, on the south by Dharawad District and Uttara Kannada districts, and on the southwest by the state of Goa.

The district has 10 talukas. Except Belgaum city in the district, all the areas are rural areas where the main business of the people is agriculture. Rice, sugarcane and jawar are the main crops grown in the district. The people mostly take only one crop in a year. Only in irrigated areas they prefer to take 2 to 3 crops per year. There are 1275 villages in this district where the people are diversifying the agricultural business.

### **Rural and Agricultural development in Belgaum district**

Agriculture happens to be the main sector of the economy in the district, which is about 67% of the geographical areas, fit for cultivation and is responsible for providing livelihood to nearly 71% of the population. The district has ideal irrigation resources in rivers, tanks, wells etc. If the major river irrigation projects are completed, it will have an ultimate irrigation potential of about 2.25 lakhs hectares. The irrigated area as a percent of the net sown areas is about 23. There remains much scope for bringing more land under irrigation. Only about five percent of the uncultivable land can be brought under the plough through land reclamation method. Tobacco cultivation is very significant in the district particularly near Nippani, Chikkodi etc. The demand for tobacco calls for the increase of tobacco production, at least by 25% more than the present level. Pachapur, Hukeri, Gokak etc., are other areas where the crop can be considerably extended. Tobacco in different forms has a greater scope for starting small-scale units of production. Sugarcane is another crop for which abundant potential exists for growing and also to utilize as raw material. The increasing area of land being available for irrigation, has given ample scope for growing more sugarcane. As a Commercial Crop, sugarcane enjoys a coveted place. Similarly cotton as a commercial crop has equal potential in the district in view of the everlasting demand for textiles throughout the length and breadth of the country and also the increasing ginning and textile mills in and around the district. The important function of Agriculture Department is to take new and scientific methods of cultivation to the farmers at remote corners of countryside. It aims at increase in agricultural production and thus at the removal of rural poverty. The agriculture department over years has conducted training programmes for the farmers in the use of new and scientific techniques of agricultural production, which has resulted in increased yield per acre. There is a District Agriculture Training Centre functioning at Arabhavi in Gokak Taluka for this purpose. The centre also provides the awareness of allied enterprises like Sericulture, Horticulture, Dairy and Animal Husbandry to youth and women farmers.

There are also Agriculture Assistants at village and grass-root level who have been regularly in contact with the farmers to give them technical guidance in the use of fertilizers, pesticides etc. The Agriculture Department through the extension officials has successfully launched new crops and high yielding varieties in this district in case of cereals, pulses, oilseeds and commercial crops. The Karnataka Government has started computerized Raita Mitra Kendra's at every hobli headquarters. In Belgaum District 35 Raita Mitra Kendra's have been started.

The objectives of establishing Raita Mitra Kendra are:

1. To provide updated information of crop productions, production practices, etc.,
2. To facilitate on site provision of Agricultural Inputs like fertilizer, seeds etc.,
3. To facilitate on site provision of Primary testing facilities like seed germination,
4. To provide for demonstration of both public and private seed materials.
5. To provide a forum for interaction between public and private sector technologies.

The Agriculture Department has the responsibilities of procuring enough seeds well in advance to supply them to the farmers at the beginning of the sowing season. The department has Seed Production Centres at 1. Hukkeri 2. K. Chandargi 3. Saundatti 4. Athani 5. Soundalag. The Agriculture Department has responsibility in making sufficient fertilizers available to the farmers at fair prices. The field staffs of Agriculture Department are involved in motivating the rural families in constructing Bio- gas plants. The farmers belonging to different categories are being provided with subsidized seeds, pesticides, Bio-agents and fertilizers through different scheme.



## Diversification of Agriculturists

### Dairy farming

Milk and milk products are everyday need of the people. The farmers in Belgaum district have recognised a very good opportunity in this field. The number of dairy societies are increasing in villages. The number of litres of milk produced in rural areas is increasing. The people earned a good life through the earnings from milk. It is the life giving business which is the alternative success in case of failure of monsoon. The dairy business in Belgaum district is controlled by Belgaum Milk Union Limited (BEMUL) which is functional in the milk rich district of Belgaum in Karnataka. Its milk-shed area includes the whole district of Belgaum. The government of Karnataka established the Belgaum Dairy in 1966 with a capacity of 10 TLPD (Thousand litres Per Day) and procurement of 3000 litres per day. In 1985, it was taken over by the Belgaum Milk Union (BEMUL). On its joining the KMF (Karnataka Milk Federation) in 1985, it became as part of the area in which the operation flood was implemented. Under this, a new dairy with a capacity of 60 TLPD was established at a cost of Rs.5.82 crores. A chilling centre with a capacity of 20 TLPD and farm cooler with a capacity of 60 TLPD was also established as a part of this scheme Today the union is procuring milk from over 435 DCSs (Dairy Co-operative Societies) of which 321 are functional. These functional DCSs have shown steady increase over the past few years with the member starting in 2002 it were 57323 and in 2011 it were 75928 members. The effort of the union on the procurement side has lead to its procuring an average of 89040 litres in 2011 of milk every day. During 2015-16, the Belgaum district has produced 6,47,000 tons milk which is also sent to neighbouring states. The number of dairy co-operative societies is increasing due to the increasing number of educated youth in rural area.

### Poultry farming

Karnataka state accounted for about 5 per cent and 1.5 per cent to the country's total egg and poultry meat production respectively. The state has occupied 6<sup>th</sup> place in egg production and 10<sup>th</sup> place in poultry meat production. In 2011-12, the egg production was 34,699 lakhs in number and 38 metric tonnes of poultry meat production (<http://dahd.nic.in/dahd/default.aspx>). The poultry meat production in Belgaum district has increased from 804 tonnes in 2009 to 3,334 tonnes in 2011 and egg production has decreased from 545 lakhs in 2009 to 403 lakhs in 2011. According to Department of Animal Husbandry, Karnataka the position of Belgaum district with respect to poultry meat and egg production was first and fourth place, respectively in Northern Karnataka The poultry industry in Belgaum district has come up very well due to many favourable conditions. University of Agricultural sciences, Dharwad, Department of Animal Husbandry, Belgaum, Krishi Vignana Kendra, Tukanatti Gokak, Grameena Training Centre and Regional Agricultural Research Station, Bijapur are operating in the district, giving all the guidance and technical knowledge for the poultry farmers. There are many hatcheries and feed manufacturing units operating in the district to help the farmers in poultry farming. Due to these factors, Belgaum district is considered to be one of the leading poultry industry in the state.

### Brick making

The brick making has given new life to the people in Belgaum district. The manufacturing process in this business is easy and therefore the farmers in Belgaum district are preferring to manufacture bricks in the no crop season. Preparation, drying and firing are three steps in this business. In Belgaum district, Khanapur taluka is famous for this industry. Every farmer prefers to prepare bricks and sell. The brick industry has given more economic benefit to these farmers. About 2.5 lakh workers are involved in this industry and day by day the number is increasing. Since soil, wood and water are the raw materials for this industry, which are easily available in rural areas, it is prospering to improve the quality of life of farmers. The brick making machine is manufactured in Belgaum, hence the farmers are now manufacturing the bricks through machines. Now clay bricks, cement bricks, stone bricks are varieties available in the district. The bricks are sent to Kolhapur, Goa and other areas. The other talukas are Chikkodi, Ramdurg, Gokak are also involved in brick making business.

### Conclusion and suggestions

1. The skill development programmes needs to be organised in rural areas so that the rural youth can produce more output through diversified business activities in rural areas.
2. The machineries should be served at subsidised rates to rural farmers. They include brick making machineries, grass cutting machines, milk sucking machines, poultries food, etc.

3. Training is needed to the farmers because they are following the traditional methods of doing agriculture. The benefits of seasonal alternatives in economic production should be well informed to the farmers in rural areas.
4. The rural universities need to be established only to provide the skill education of agricultural development. The tour of farmers to Israel can be organised to educate the rural farmers.
5. The farmers who are facing the problems of crop loans NPA should be well trained to diversify their agricultural business so that they shall not face the problem of loan recovery measures resulting into unsolvable problem.
6. The Government should develop the skill development programmes to initiate the skills for rural farmers to diversify their business.

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## Agricultural Technology Implementation in Sangli District

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### Abstract:

*In recent years, sustained growth of agriculture in the long run depends on improving farming technology in the country. Introduction of agricultural technology seems to offer an opportunity to increase output and income of farmers substantially. For this region adoption of technology innovations in backward agriculture has been drawing attention of economists for development. But the point that needs special attention is that till now the introduction of agricultural technology has met many problems. There is positive association between the farm size and adoption of agricultural technology agriculture is completely depending upon water. Some areas are drought prone area and some non drought prone areas. In drought prone areas the use of agricultural technology is less because agricultural investment is less in that area and as a result production is less. Moreover the use of technology is more in non drought prone areas because agricultural investment is more and therefore production is more. In this context it is relevant to study the impact of new agricultural technology.*

**Keywords:** Agricultural Technology Implementation

### 1. Introduction:

India is an agricultural country where 65 percent direct and indirect population is dependent on agriculture. Agriculture is the main source of income. Hence it is said that agriculture in India is the backbone of Indian economy. Agriculture is the art or science of production of crops and livestock on the farm. Agriculture plays a crucial role in the life of an economy. Agricultural technology plays an equally important role in affecting agricultural income. Initially a marginal rise in the cost of production results in substantial gains in agricultural income owing to the adoption of technology. Farmers have come forward to adopt technology and the society as a whole stand to benefit by enjoying more quantity and better quality. Sometimes an agricultural technology adopted not to increase money incomes. However, to afford greater leisure time improved farm technology can always lead to better methods of production resulting in saving of time and effort while raising same level of output as before. In fact, the adoption of agricultural technology helps in promoting economic welfare in several.

### 2. Statement of the Problem:

Agriculture is the main occupation of the majority of population in Sangli district. About 65 percent of population in Sangli district engaged in agricultural and related activities. The farmers of the district rely heavily on agriculture for earning their livelihood. The development of agriculture depends on various aspects such as type of soil, relief, vegetation, climatic conditions, attitudes of different social groups of farmers to agriculture, use of irrigation, HYV seeds, fertilizer, pesticides and insecticides, use of mechanical tools and implements, as well as proper scientific rotation of crops by which production be enhanced. The impact of these aspects of agriculture varies in different areas of the district. Cropping intensity of Sangli district is less as compared to Maharashtra state. Hence, it is very much necessary to study the problems of less cropping intensity and use of technology in Sangli district of the state Maharashtra. Therefore, present the research topic has been chosen and taken up for study.

### 3. Significance Of The Study:

Technology plays a basic role in the making of production possible. Farming has always adopted a technology suited to its stage of development and the nature of requirements. With the man towards a new social order, the nature of agricultural technology has changed gradually from its traditional character to modern stage. The technology has played a significant role in strengthening the farmers hold on agricultural resources and enabling them to reap better harvest.

Farm technology or mechanization may be defined as the use of improved types of iron-based land tools, drought driven implements and power driven equipment. It is observed that there has been awareness among the farmers regarding the merits of improved implements. Even small farmers

prefer to hire modern implements particularly for plugging land preparation, winnowing and harvesting etc. (Kokate, 2013, Pp. 1 and 2)

#### 4. Objectives of The Study:

The important objectives of the present research study are as follows:

1. To study the agricultural technology used in Sangli district.
2. To identify the problems and suggest the remedial measures for the improvement of production in Sangli district.

#### 5. Scope of The Study:

1. **Geographical Scope:** The geographical scope of the study is limited to Sangli district.
2. **Topical Scope:** The topical scope has focused on the 'Cropping Intensity Index of Sangli District with Reference to Agricultural Technology.'
3. **Analytical Scope:** Analytical scope has covered the fulfillment of the objectives set out and testing of the hypothesis.
4. **Functional Scope:** The functional scope was confined to offering a set of meaningful suggestions aimed at improving the agricultural productivity.

#### 6. Research Methodology:

##### Method of Data Collection:

For accomplishing the objectives set out for the study and for testing of the hypotheses both primary and secondary data have been collected.

**Primary Data:** The primary data have been collected from survey by using structured questionnaire and personal interviews through small, medium and large farmers in Sangli district. For the present study researcher has selected sample from Sangli district and used stratified sampling technique.

**Secondary Data:** The necessary secondary data for completing the investigation have been collected mainly from published sources in academic libraries, records, books and journals, articles, government reports, websites, newspapers, daily archives, economy survey government of Maharashtra, agricultural statistics at a glance, hand book of statistics on Indian state, at a glance all reports in Sangli district, socio economic cast survey report, agriculture technology management agency (ATMA) report, Sangli district C-DAP reports etc.

#### 7. Limitations of The Study:

1. This study has been limited only to Sangli district. So, inferences drawn will be applicable only to sample district.
2. The conclusion has been drawn from the selected villages in Sangli district.

#### 8. Data Analysis and Interpretation:

##### 8.1 Block Wise Tractors Intensity in Sangli District (2014-15):s

Table No. 1.1

Block Wise Tractors Intensity in Sangli District (2014-15)(Area in Hectares)

Sr. No.	Block	No. of Households	No. of Tractors	% of Each Block	Net sown Area	Tractor Intensity	Ranking
1.	Shirala	247	455	5.77	39992	1.14	6
2.	Walva	1730	1785	22.64	60813	2.94	1
3.	Miraj	1438	1466	18.60	66625	2.20	2
4.	Palus	95	95	1.21	20700	0.46	10
5.	Kadegaon	248	248	3.15	51177	0.48	9
6.	Khanapur	436	436	5.53	55406	0.79	7
7.	Tasgaon	725	790	10.02	47270	1.67	3
8.	Atpadi	843	843	10.69	54765	1.54	4
9.	K. Mahankal	535	535	6.79	43219	1.24	5
10.	Jath	1190	1230	15.60	193098	0.64	8
11.	<b>Sangli</b>	<b>7487</b>	<b>7883</b>	<b>100</b>	<b>633065</b>	<b>1.25</b>	<b>-</b>

Source: Agriculture Technology Management Agency (ATMA) Report 2016-17  
 Sangli District C-DAP Report 2016-17

The tractor is multipurpose agricultural equipment which aims at reducing the drudgery of certain operations which have to be performed either by human labour or combined efforts of human beings and animals such as ploughing and tillage operations with harrowing levelling, harvesting, etc. causing into an increase in agricultural efficiency.

The table 1.1 reveals the block-wise tractor intensity of Sangli district. Walva block has registered highest tractor intensity (2.94%) followed by Miraj (2.20%), Tasgaon (1.67%), and Atpadi (1.54%) of Sangli district 2014.15. However, Palus block has registered lowest tractor intensity (0.46%) followed by Khanapur (0.79%), Kadegaon (0.48%) Shirala (1.14%), Jath (0.64%) and KavatheMahankal (1.24%) of Sangli district 2014-15. Moreover, tractor intensity of Sangli district is (1.25%) in 2014-15. It is conclude that high tractor intensity in Walva block is 2.94% and low tractor intensity in Palus block i.e. 0.46% of Sangli district in the year of 2014-15.

### 8.2 Block Wise Electric Pump-Set Intensity in Sangli District (2014-15):

Table No. 1.2

Block Wise Electric Pump-Set Intensity in Sangli District (2014-14) (Area in Hectares)

Sr. No.	Block	Net sown Area	No. of Pump sets	% of Each Block	Pump set Intensity	Ranking
1.	Shirala	39992	6516	3.27	16.29	10
2.	Walva	60813	31395	15.73	51.63	3
3.	Palus	20700	16186	8.11	78.19	1
4.	Kadegaon	51177	11147	5.59	21.78	8
5.	Khanapur	55406	16423	8.23	29.64	6
6.	Atpadi	54765	13527	6.78	24.70	7
7.	Tasgaon	47270	24523	12.29	51.88	2
8.	Miraj	66625	29212	14.64	43.85	4
9.	K.Mahankal	43219	18179	9.11	42.06	5
10.	Jath	193098	32459	16.26	16.81	9
11.	<b>Sangli</b>	<b>633065</b>	<b>199567</b>	<b>100.00</b>	<b>31.52</b>	-

Source: Agriculture Technology Management Agency (ATMA) Report 2016-17

Table 1.2 shows the blockwise distribution of electric pump sets intensity in Sangli district. Palus block has registered highest electric pump sets intensity (78.19%) followed by Walva (51.63%), Miraj (43.85%), Tasgaon (51.88%), and KavatheMahankal (42.06%) of Sangli district 2014.15. However Shirala block has registered lowest electric pump sets intensity (16.29%) followed by Khanapur (29.64%), Kadegaon (21.78%) Jath (16.81%) and Atpadi (24.70%) of Sangli district 2014-15. Moreover electric pump sets intensity of Sangli district is (31.52%) in 2014-15. It is conclude that high electric pump sets intensity in Palus block is 78.19% and low electric pump sets intensity Shirala block is 16.29% of Sangli district 2014-15.

### 8.3 Block Wise Sprayers Intensity in Sangli District (2014-15):

Table No. 1.3

Block Wise Sprayers Intensity in Sangli District (2014-15) (Area in Hectares)

Sr. No.	Block	No. of Household	No. of Sprayers	% of Each Block	Net sown Area	Sprayers Intensity	Ranking
1.	Shirala	22825	22975	12.81	39992	57.45	2
2.	Walva	38572	66550	37.11	60813	109.43	1
3.	Miraj	27620	32240	17.98	66625	48.39	3
4.	Palus	30	30	0.02	20700	0.14	10
5.	Kadegaon	79	79	0.04	51177	0.15	9
6.	Khanapur	15768	15768	8.79	55406	28.46	5
7.	Tasgaon	9200	14000	7.81	47270	29.62	4
8.	Atpadi	3890	3890	2.17	54765	7.10	8
9.	K.	3650	3650	2.04	43219	8.45	7



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	Mahankal					
10.	Jath	187030	20128	11.23	193098	10.42
<b>11.</b>	<b>Sangli</b>	<b>308664</b>	<b>179310</b>	<b>100.00</b>	<b>633065</b>	<b>28.32</b>

Source: Agriculture Technology Management Agency (ATMA) Report 2016-17

Table 1.3 reveals the blockwise distribution of sprayers and intensity in Sangli district. Walva block has registered highest sprayers intensity (109.43%) followed by Shirala (57.45%), Miraj (48.39%), Tasgaon (29.62%), and Khanapur (28.46%) of Sangli district 2014-15. However Palus block has registered lowest sprayers intensity (0.14%) followed by KavatheMahankal (8.45%), Kadegaon (0.15%) Jath (10.42%) and Atpadi (7.10%) of Sangli district 2014-15. Moreover sprayers intensity of Sangli district is (28.32%) in 2014-15. It is noted that high sprayers intensity in Walva block is 109.43% and low sprayers intensity Palus block is 0.14% block of Sangli district 2014-15.

#### 8.4 Block Wise Harvester and Thresher in Sangli District (2014-15):

Table 1.4 indicates the blockwise distribution of harvester and thresher and its intensity in Sangli district. Tasgaon block has registered highest harvester and thresher intensity (1.52%) followed by Shirala (0.68%), Walva (0.90), Miraj (0.86%) and Atpadi (0.68%) of Sangli district 2014-15. However, Kadegaon block has registered lowest harvester and thresher intensity (0.03%) followed by KavatheMahankal (0.24%), Palus (0.12%) Jath (0.07%) and Khanapur (0.41%) of Sangli district 2014-15. Moreover sprayers and thresher intensity of Sangli district is (0.47%) in 2014-15. It is noted that high harvester and thresher intensity in Tasgaon block is 1.52% and low harvester and thresher intensity Palus block is 0.03% block of Sangli district 2014-15.

**Table No. 1.4**  
**Block Wise Harvester and Thresher and Intensity in Sangli District (2014-15) (Area in Hectares)**

Sr. No.	Block	No. of Household	No. of Harvester & Thresher	% of Each Block	Net sown Area	Harvester & Thresher Intensity	Ranking
1.	Shirala	273	273	9.16	39992	0.68	4
2.	Walva	545	545	18.29	60813	0.90	2
3.	Miraj	570	570	19.13	66625	0.86	3
4.	Palus	25	25	0.84	20700	0.12	8
5.	Kadegaon	15	15	0.50	51177	0.03	10
6.	Khanapur	352	225	7.55	55406	0.41	6
7.	Tasgaon	720	720	24.17	47270	1.52	1
8.	Atpadi	370	370	12.42	54765	0.68	4
9.	K. Mahankal	105	105	3.52	43219	0.24	7
10.	Jath	215	131	4.40	193098	0.07	9
<b>11.</b>	<b>Sangli</b>	<b>3190</b>	<b>2979</b>	<b>100.00</b>	<b>633065</b>	<b>0.47</b>	<b>-</b>

Source: Agriculture Technology Management Agency (ATMA) Report 2016-17

#### 9. Findings:

1. It is finding that high tractor intensity in Walva block is 2.94% and low tractor intensity in Palus block i.e. 0.46% of Sangli district in the year of 2014-15.
2. It is noticed that high electric pump sets intensity in Palus block is 78.19% and low electric pump sets intensity Shirala block is 16.29% of Sangli district 2014-15.
3. It is noted that high sprayers intensity in Walva block is 109.43% and low sprayers intensity Palus block is 0.14% block of Sangli district 2014-15.
4. It is noted that high harvester and thresher intensity in Tasgaon block is 1.52% and low harvester and thresher intensity Palus block is 0.03% block of Sangli district 2014-15.

#### 11. Conclusion:

The present research studied the agricultural technology implementation in Sangli district. In spite of the large scale mechanisation of agriculture in some parts of the country, most of the

agricultural operations in larger parts are carried on by human hand using simple and conventional tools and implements like wooden plough, sickle, etc. Little or no use of machines is made in ploughing, sowing, irrigating, thinning and pruning, weeding, harvesting threshing and transporting the crops. Agricultural implements and machinery are a crucial input for efficient and timely agricultural operations, facilitating multiple cropping and thereby increasing production. Some progress has been made for mechanising agriculture in India after Independence. Need for mechanisation was specially felt with the advent of Green Revolution in 1960s. This section reviews the development of agricultural policy in India since independence through five year plans. Various committees have been constituted to review and suggest policies relating to different aspects of agricultural sector like agricultural production, credit, processing, marketing etc.

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## Religious Tourist Centre Oriented Rural Settlement Pattern

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### Abstract:

*Tourism is one of the new emerging activities not only in India's well developed destinations but also some districts and tehsils completely depend upon tourism. It is possible only because of reality of Indian physiographic, Culture and Historical factors. Navapur tahsil is one of them this tahsil well known for the large Ukai Dam is near the city of Navapur.*

*Amongst the temples in the areas are the Rokadia Hanumaan at Wankipada Bridge, Dutt mandir and Rang Avdhoot Paduka Mandir near the Juni post office, Ramji Mandir in Sardar Chawk, Aashapuri Mandir in Shroff Falia, Sai Baba temple in the Prabhakar colony and Shabri Mata Mandir, located in Subir village. Mission Tekdi and Tulsyo donger are place of interest for many.*

*Therefore present challenge is made here to study distribution and spacing of new rising tourism centers. Calculation is complete by using primary as well as secondary data. Collected data will be analyzed by using nearest neighbor technique of Evans and Clark. As per this method the all rural tourist centers spacing clustered in pattern and has vast scope for development.*

**Keywords:** Tourism, Nearest Neighbor Technique, Deomogra mata yatra. Etc.

### Introduction:

Today, tourism is known as the fast developing activity of the world. The world accepted the significance of tourism in the economy of that place, so day by day various tourist places are immersing all the way through the world. To preserve and protect the tourist centers are necessary for the tourism development. In Navapur tahsil there are various rural tourist places are situated this all places have its own historical, cultural, geographical as well as religious importance. These all destination are not uniformly distributed all over the tahsil. And to study of these tourist destinations and its circulation is very necessary for the future planning.

Surrounded by the temples in the areas are the Rokadia Hanumaan at Wankipada Bridge, Dutt mandir and Rang Avdhoot Paduka Mandir near the Juni post office, Ramji Mandir in Sardar Chawk, Aashapuri Mandir in Shroff Falia, Sai Baba temple in the Prabhakar colony and Shabri Mata Mandir, located in Subir village. Mission tekdi and Tulsyo donger are place of interest for many.

Nandurbar district is rich socio-cultural establishment and religious historical background. Also it is bounded by religious centers; such as Prakasha, one of the famous religious places, also known as Dakshin Kashi, temples of God Shree Ganesh (Heramb), Shri Datta temple, Umaj Mata temple, Ashwashtama and Shanimanda, Dandapaneshwar Ganesh Mandir, Devi Dev Mogra Mata (Yahamogi mata) is mother goddess of Adivasis community. Toranmal, Gaumukha, Aikuvali mata. The weekly bazaar is called Shanivari (*Navapuryo*) i.e. held on each Saturday.

### Objectives:

- To study the sorting and division of rural tourist centers.
- To study the spacing of rural tourist Centers.
- To introduce the new rising tourist destination.

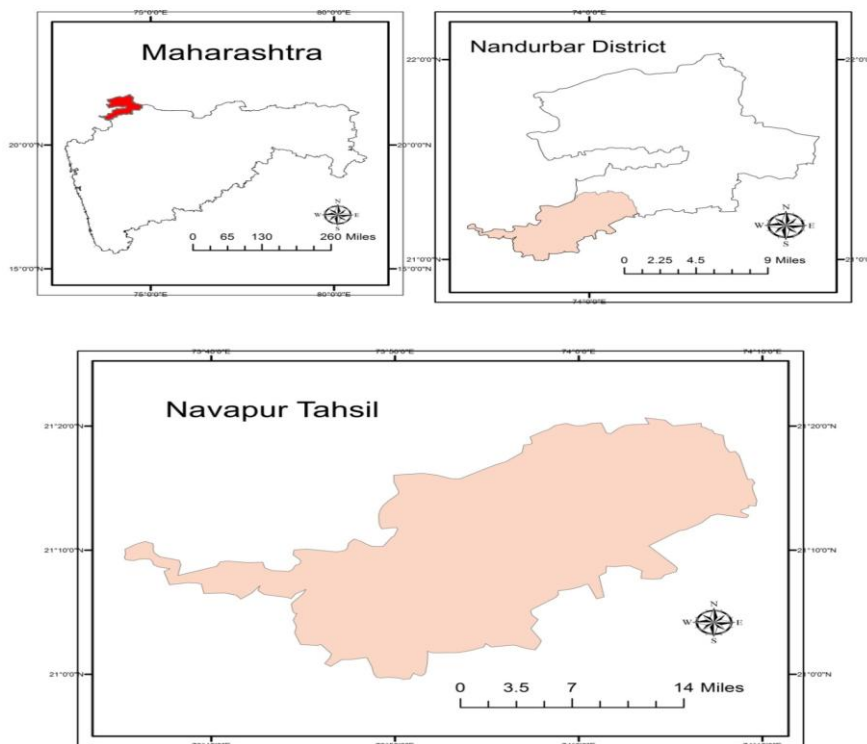
### Methodology:

This study is based on primary as well as secondary data sources. Primary data regarding the distribution and classification of tourist spot obtained through participatory field visit while secondary data is collected by various sources like book, journals, maps, news papers etc. For the analysis of data nearest neighbor technique has been used.

### Study Region:

Navapur tahsil is the south most tahsil of the Nandurbar district. Navapur has its history of It was earlier on the Mughal trade route going to Agra and a few ruins of the Serai and Caravan sentry forts still survive. This tahsil bounded from south by Rangavali River and Dang district Gujarat state to the north Uchhal tahsil, the east sakri, to the west songadh. Tahsil bounds this tahsil. It lies between the 21 10 12North and 73 46 48East longitudes. This tahsil covers area about 976.68sq.km, some of

the area is hilly and the habitat of [scheduled tribes](#) (85.52%). 2,71,852 (2011) populations concentrated in this tahsil. This tahsil have Rangavali River as well as hill of sahyandri branches.



Location map

### Distribution of Tourist Rural Settlement Centers:

In Navapur tahsil there are near about 15 places which are immersing as the tourist destinations or picnic spots. Out of these each and every place have its own characteristics. We can observe 15 religious tourist centre. Gaumukh and aaiuwali (Khekhda), Tulzamata (Chouki), Deo mogramata Temple(Gadad,Chitvi,Bardipada), Hindladevi (Dhanrat), Adimata temple (Vadfali, Khatgaon, Gadi), Haldani Gadi, Bardu temple, Bhadvad temple, Allardari (Bardipada), Hanuman temple, Marimata temple (Ghodjamane, Kaalamba). Settlements are establish as per different fairs and festivals

### Spacing of Religious Tourist Rural Settlement Centers:

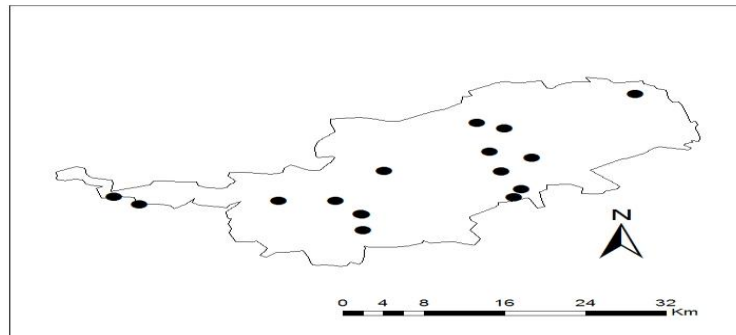
The spacing is a change of an idea of distance which is essentially linear spacing because of its area measurement is essentially more physical. It is immediately the regional socio economic distributes. (Bansal S.C.) A measurement of distance between the tourist places in Navapur tahsil is done by the “**Nearest Neighbor Method**”. According to the concept, spacing of places is calculated by the  $R_n$  values, which calculated by the measuring actual straight line distance between two nearest tourist places and comparison this distance with the expected distance between those points

$$R_n \text{ Value} = \frac{D_{obs}}{D_{ran}}$$

Where,  $R_n$  = The nearest neighbour index  
 $D_{obs}$  = mran observed nearest neighbour distance  
 $a$  = the size of area  
 $n$  = total no.of points

Here,. So the  $R_n$  value is obtained 0.97 as per above formula. So we can say that the spacing of religious tourist rural settle ment centers in the tahsil is random pattern.

## Navapur Tahsil Tourist Centres



### Spacing of Rural religious Tourist Centers in Navapur Tahsil:

#### Conclusion:

In the Navapur tahsil of Nandurbar district there are 15 religious tourist rural settlement centre are observed. The spacing between these points is random in nature. Out of these most places are under the construction an soon these places are emerged and developed as the religious tourist hubs of Navapur tahsil. Some of the places among them are under the development through the governments various schemas. So it is necessary to develop infrastructure facilities for tourists among these places are very needful to attract more tourists towards these places.

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## Soil Fertility Status Using Nutrient Index Approach

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### Abstract

A detailed soil survey was undertaken in all tehsils in Kolhapur district of Maharashtra with the aim of evaluating the fertility status of soils using nutrient index method. A total of 9426 surface samples were collected analyzed for pH, electrical conductivity, organic carbon, available nitrogen, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O and available micronutrients (Zn, Mn, Fe & Cu) using standard analytical methods. Based of fertility ratings, pH of soils was acidic to alkaline. Electrical conductivity was normal (<1.0 dS/m). Soil organic carbon was very low to very high, with more than 70% of study area falling in the high category. Exchangeable water class contents were C1S1 to C4S4. Available macronutrient status (N, P, and K) were very low to very high. The availability of micronutrients was highly variable. Zinc (Zn) was deficient to medium, iron (Fe) was deficient, while manganese (Mn) and copper (Cu) were low to high. Based on the nutrient guides, the study that the pH is low to medium, electrical conductivity is high, nitrogen is low to medium, phosphorus is medium to high and potassium is high. Soil reaction, available N, K, P, Zn & Fe were observed as the most important soil fertility constraints that could affect sustainable crop production in the study area. The situation therefore demands the adoption of appropriate management practices in order to improvement the fertility status. These practices may include such practices as site specific nutrient management, increased use of organic nutrient sources, sustainable land use and cropping structures, and appropriate agronomic practices.

**Key words:** Nutrient index, fertility status and quality macronutrients, micronutrients

### Introduction

Soil is a natural mix of organic matter and weathered rock that forms on the Earth's surface. It is the basis or foundation for all crop production. It is biologically active and capable and home to a large range of living organisms including earthworms, soil microbes, and growing plant roots. Present chapter deals with the study of fertilizer recommendation as an important part of agricultural technology. Macronutrient and micronutrient are important for plant growth. The present study analyzed the spatial variation in utilization of NPK nutrients and to examine the relationship between fertilizer use and type of soil and pH and EC. Beside these and attempt has also been made here to examine the distribution of salinity and alkalinity in Kolhapur district.

Soil is composed of minerals, air, water, and organic matter that are important for healthy plant growth. The ability of soil to provide essential nutrients is called fertility. (John Lamb, Sheri Huerd, Kristine Moncada, 2000)

The term fertility is used differently in different context as there is no absolute scale of fertility. Soil fertility is the capabilities of soil of producing a plant yield under define conditions. (De,1981).Whereas the capability to plant yield more or less depend on nutrient content availability and accessibility in the soil inviting the study of nutrient content in the soil along with other consideration. Apart from the physical support and moisture a boost of element like Nitrogen, Phosphorus, Potassium, Sulfur, Calcium, Iron, Magnesium, Boron, Manganese, Copper, Zinc and Molybdenum are taken by plants as nutrients from soil. But important element described as "Big Three" are Nitrogen, Phosphorus, Potassium (NPK) Iron, Manganese, Copper and Zinc. Usually soil fertility is evaluated by determining these big three element (Penchalaiah, 1993).

Soil organic matter is promoted by crop residue, diverse rotations, conservation tillage and cover crops. Organic matter is beneficial to agricultural land or soils because it enhances water infiltration, fertility and microbial activity, soil water holding capacity. Farming techniques that preserve and improve organic matter content promote long-term soil fertility and produce healthy crops. (Dr J Floor Anthoni (2000)

In recent year's development of lift irrigation, co-operative societies have accelerated the place of agriculture production. There by directly affecting the quality of soil in Panchaganga Basin. In particular excess use of irrigation and over doses of chemical fertilizers has directly affected the soil quality. (Patil, 1987).The fertility status of soil is largely related to the nutrient availability in the soil which varies from place to place. An attempt is made hence forward to focus an attention on the spatial pattern of NPK content in the soil.

### Objective-

To assess soil fertility status and soil quality in Kolhapur district

### Study Region

The Kolhapur district is one of the southernmost districts of Maharashtra state. The district's courtiers a total area of 7,685 sq. kms. It lies between 16° 0' 0"N to 17° 0' 0" North latitude and 74° 0' 0" to 75° 0'0" East longitude. The length of the district south to north is 160 Kms. and east to west is 60 Kms. The Sahyadri ranges to the west and Warna river to the north, the river Krishna and Belgaum district to the south and east, forms the natural boundaries of the district. The region receives average rainfall 1900 mm.



Fig. 1

### Methodology

The study is based on data collected from primary and secondary sources. To evaluate the fertility status of soils in the study area, different soil physico-chemical properties that affect nutrient availability including pH, electrical conductivity, available N, P, K and S and available micronutrients (Zn, Mn, Fe and Cu) were calculated based on the specific rating chart (Table 1).

In order to compare the levels of soil fertility of one area with those of another it was necessary to obtain a single value for each nutrient. Here the nutrient index introduced by Parker et al. (1951). **Parker's nutrient index** is a six tier system used to evaluate the fertility status of soils based on the percentage of samples in each of the six classes, that is, very low, low, medium, medium high, high and very high and multiplied by 0.50, 1.00, 1.50, 2.00,2.50, and 3.00 respectively. The sum of the figures thus obtained is divided by 100 to give the index or weighted average as given in the equation below:

$$\text{Nutrient Index} = \{(0.50 \times A) + (1.00 \times B) + (1.50 \times C) + (2.00 \times D) + (2.50 \times E) + (3.00 \times F)\} / \text{TNS}$$

Where A = Number of samples in very low category; B = Number of samples in low category; C = Number of samples in medium category, D= Number of samples in medium high category; E=Number of samples in high category; F= Number of samples in very high category; TNS = Total number of samples. The nutrient index with respect to soil pH, organic carbon, available N, P and K were used to evaluate the fertility status of soils in the Kolhapur district. The rating chart is given in Table 2.

**Table 1.**  
**Rating chart for soil test values and their nutrient indices.**

Soil property	Unit	Range		
Soil pH	pH unit	< 4.5 (extremely Acidic)	6.6 – 7.5 (Neutral)	>9.0 (extremely Alkaline)
Electrical conductivity	dS/m	<1.0 (Normal)	1.0-2.0 (Critical)	>2.0 (Injurious)
Organic Carbon	%	<0.5 (Low)	0.5-0.75(Medium)	>0.75 (High)
Available Nitrogen	kg/ha	<280 (Low)	280-560 (Medium)	>560 (High)
(N)				

Available Phosphorus (P <sub>2</sub> O <sub>5</sub> )	kg/ha	<10 (Low)	10-25 (Medium)	>25 (High)
Available Potassium (K <sub>2</sub> O)	kg/ha	<110 (Low)	110-280 (Medium)	>280 (High)
Available Zinc (Zn)	ppm	<0.6 (Low)	0.6-1.0 (Medium)	>1.0 (High)
Available Manganese (Mn)	ppm	<2.0 (Low)	2-3 (Medium)	>3.0 (High)
Available Iron (Fe)	ppm	<0.2 (Low)	0.2-0.6 (Medium)	>0.6 (High)
Available Copper (Cu)	ppm	<4.5 (Low)	4.5-5.5 (Medium)	>5.5 (High)

Source-District Soil Survey and Soil Testing Laboratory, Kolhapur.

**Table 2.**  
**Nutrient index with range and levels.**

Sr.no	Fertility index range	level
A	0.50- 0.75	Very low
B	0.76- 1.25	Low
C	1.26- 1.75	Medium
D	1.76- 2.25	Medium high
E	2.26- 2.75	High
F	2.75-3.00	Very high

Source-District Soil Survey and Soil Testing Laboratory, Kolhapur.

**Table 3**  
**Soil Fertility Status Samples Analyzed during the Period (2013-2014)**

MICRO-NUTRIENT	VL	L	M	MH	H	VH	TOTAL
A) ORGANIC CARBON	74	560	1326	2027	2046	3393	9426
B)AVAILABLE P <sub>2</sub> O <sub>5</sub>	393	955	1134	997	741	5206	9426
C)AVAILABLE K <sub>2</sub> O	206	512	877	895	1094	5842	9426
	S		NEUTRAL		ALK		TOTAL
D) pH	3009		3627		2790		9426
	NEUTRAL		CTIT		INJU		
E) EC	9404		12		10		TOTAL

Source-District Soil Survey and Soil Testing Laboratory, Kolhapur.

### Soil fertility status-

Soil fertility status of 9426 no. of samples analyzed during 2013-14 given below:

#### I) Organic Carbon:

The data of analysis of 9426 soil samples for soil fertility status of organic carbon reveals that 3393 soil samples are very high organic carbon fertility status in Kolhapur district.

#### II) P<sub>2</sub>O<sub>5</sub>:

Phosphorus has been called the “Master key to agriculture” because low crop production is attributed mainly to the deficiency of phosphorus, except nitrogen, than the deficiency of other elements (Singh et al., 2016). The data of analysis of 9426 soil samples for soil fertility status of P<sub>2</sub>O<sub>5</sub> reveals that 5206 soil samples are very high phosphorus fertility status in Kolhapur district.

#### III) K<sub>2</sub>O :

The data of analysis of 9426 soil samples for soil fertility status of K<sub>2</sub>O reveals that 5842 soil samples are very high potassium fertility status in Kolhapur district.

#### pH:

The pH and alkalinity are important factors influences factors the suitability of water for irrigation purpose. The water samples of the study area having pH range between 6.62 to 8.23, indicating its suitability for irrigation purpose Soil pH describes the concentration of hydrogen ions (H<sup>+</sup>) in a soil. The pH scale runs from 0 to 14. A pH of 7 is neutral, less than 7 is acidic, and greater than 7 are alkaline or basic. (District Soil Survey and Soil Testing Laboratory). Soil pH is critical because plants vary in the required pH range for best growth and yields. Most important field crops grow best at a pH of 6–7. Additionally, pH influences the availability of nutrients to plants. pH affects

the growth of beneficial soil organisms that facilitate biological nitrogen fixation with legumes and of microbes mineralizing nitrogen from organic matter.

The data of analysis of 9426 soil samples for soil reaction (pH) reveals that 38.47 % soils are neutral in reaction whereas 29.59 % and 31.92 % soils are alkaline and acidic in reaction respectively Kolhapur district.

#### **EC :**

The most significant water quality guideline on crop productivity is the water salinity hazard as measured by electrical conductivity (Johnson and Zhang, 1990). The electrical conductivity (EC) is the measure of the soluble salts present in the soil and is affected by cropping sequence, irrigation, land use and application of fertilizers, manure, and compost (Singh et al., 2016). The data of analysis of 9426 soil samples for Electrical Conductivity (EC) reveals that, 99.76 % soils are neutral in reaction i.e. suitable for all crops whereas 0.10 % soils are injurious for crops in Kolhapur district.

#### **Conclusion**

Soil fertility refers to the original capacity of the soil to supply nutrients in sufficient amounts and in suitable proportions for crop yield and crop growth. The trend in increasing the crop productivity or crop yield by adopting high yielding varieties has resulted in deficiency or lack of nutrients in land and has reflected as deficiency symptoms in plants growth. Hence, it is required to know the fertility (NPK) status of the soils of the district for applying the necessary dosage of fertilisers and preparation the regional distribution of fertilisers. For this purpose, the soil samples collected from all over the district were analysed for pH, Ec., organic carbon, available phosphorus and potassium in study region. The available NPK index status presented show that about 2.33 %, 2.19 % and 2.54 % of the soils in the district fall under the high category in Kolhapur district.

A pH value is ranging from 6.5 to 7.5 are considered to be normal soil. A pH value neutral is best for most plants. About 38.48% of the soils are in normal category in study area. The high percentage of this soil is observed in the circle of Gaganbavada, Karvir and Panhala. In general soil with pH value is ranging from 7.5 to 9.0 are considered to be slightly alkaline soil. About 29.60 % of the soil is in alkaline soil category in study area. In general soil with pH value is ranging from less than 4.5 to 6.5 are considered to be acidic soil. About 31.92 % of the soil is in acidic soil category in study area. The high percentages of this category of soil are observed in the circle of Panhala, Gadhinglaj, Gaganbavada, Chandgad, Radhanagari, Shahuwadi and Ajra. To study of soil fertility and quality as a significant part of health and growth of plant. With its soil fertility index characteristic and distribution samples of its impact on crop productivity and soil improvement.

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## Changing Pattern of Sex Ratio in Panhala Tehsil (1991-2011)

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### Abstract

The sex ratio is usually defined as the number of females per thousand males. The sex ratio is a function of three basic factors, i.e. sex ratio at birth, determine in mortality between sexes at different stages of life and sex selective migration. Sex ratio is an index of the socio-economic conditions persisting in an area and is a useful tool for regional analysis. The knowledge of sex ratio is essential for understanding the employment and consumption patterns and social needs of a community. The separate data for male and female are important for various types of planning and for the analysis of other demographic characteristics, such as nativity, mortality, migration, marital status and economic etc. Therefore an attempt is made here to study spatio-temporal pattern of sex ratio in Panhala tehsil. The paper is based on secondary data. To analyze spatial pattern of sex ratio the circle of Panhala are grouped into four categories on the basis of mean and standard deviation. The study reveals that the very low sex ratio is recorded in Panhala circle in term of Total and 0-6 Age group 884 and 810 respectively according to 2011 census. The Panhala Tehsil is facing major problem of gender inequality due to female feticide.

**Key words:** Pattern, Rural sex ratio, mean, standard deviation.

### Introduction

The numerical measurement of sex composition of a population is often expressed in terms of sex ratio. The concept of sex ratio is not in uniform all over the world and calculated differently in different countries. In U.S.A, the sex ratio is expressed in terms of number of males per hundred females. In New Zealand, sex ratio is expressed in terms of number of females per hundred males. In India, however, the sex ratio is expressed in terms of number of females per thousand males (Roy, 2015). The sex ratio is usually defined as the number of females per thousand males. The Sex ratio is an important demographic indicator reflecting the socio-economic structure of any society. It is one of the best indicators of status of women in the society. Sex ratio is an index of the socio-economic conditions prevailing in an area and is a useful tool for regional analysis (Faranklin, 1956).

Sex ratio of human population is one of the basic demographic characteristic, which is extremely vital for any meaningful demographic analysis. It is an index of existing socio-economic conditions of a female in any region. The knowledge of sex ratio is essential for understanding the employment and consumption patterns and social needs of a community (Trewartha, 1953). The proportions of men and women in total of a society have essential bearings in as far as it affects the labour provides through marriage and fecundity. It is usually believed that if the proportion of males is higher than that of females more workers will be available. However, in relation to the sexual status of population in country, the ratio of male and female of the study region play very important role in economic development. Therefore attempt is made here to study changing pattern of sex ratio in Panhala tehsil.

### Study Area

Panhala tehsil is situated in the northern part of Kolhapur district. It lies between 16° 35' and 16° 54' north latitudes and 73° 48' and 74° 13' east longitudes.

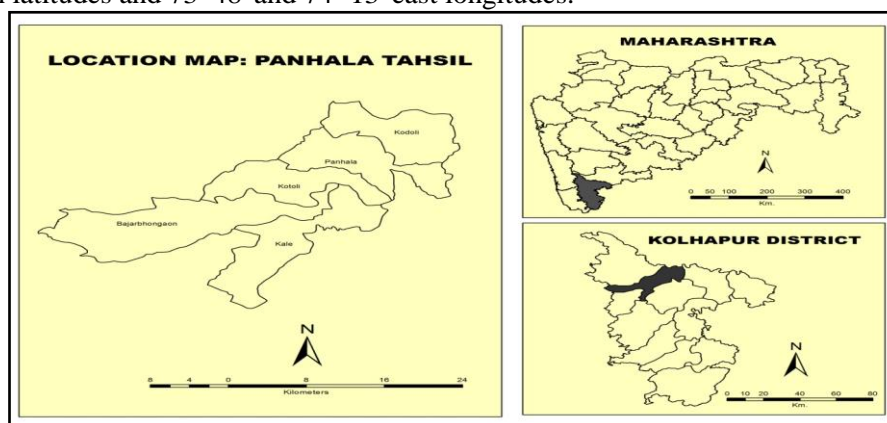


Fig No 1



It is surrounded by Sangli district to the north, Ratnagiri to the west, Hatkanangale tehsil to the east and Radhanagari tehsil to the south. The Sahyadri ranges part of Panhala fort and Masai Table land spread over in the central part of Panhala tehsil. The district has an area of 559.9 sq km and a population of 206872 (1991), 238383 (2001) and 259417 population as per census 1991, 2001 and 2011. While the geographical area of the tehsil accounts for 7.70 percent of the total area out of the Kolhapur District. The density of population is 369, 426 and 463 persons per sq km according to 1991, 2001 and 2011 census. The headquarters of the tehsil is at Panhala. Panhala tehsil have been dived in to five circles viz. Kodoli, Kotoli, Kale, Panhala and Bajarbhogaon for administrative purposes. There are 131 villages, one Nagarparishad and one census town according to 2011 census. It derives its importance from its past Historical associations and its present position as a great historical tourist centre. It is well connected by the only road of Kolhapur district as well as Maharashtra.

**Objectives**

1. To study comparatively analysis of sex ratio.
2. To study the spatio-temporal change in sex ratio of Panhala tehsil..

**Data Base And Methodology**

In order to meet these objectives the relevant information and data of male and female population are collected and used for the period of 1991 to 2011 are based on the secondary sources. Secondary data have been collected from Statistical abstracts of Maharashtra, Kolhapur district census handbook, book, journals, statistical abstract, socio-economic abstract. For the purpose of cartographic technique QGIS software has been used. For the calculate sex ratio following equation is employed.

$$SR = \frac{Pf}{Pm} \times 1000$$

Where,

**Pf** : represent number of female

**Pm**: represents number of males

The circle wise distribution of sex ratio categories in to four category viz. Very Low (Below 925), Low (926 – 950), Moderate (951 – 975) and High (Above 976). Analysis of the study has been made with help of the statistical techniques and on the basis of this results and conclusion are drawn.

**Result And Discussion**

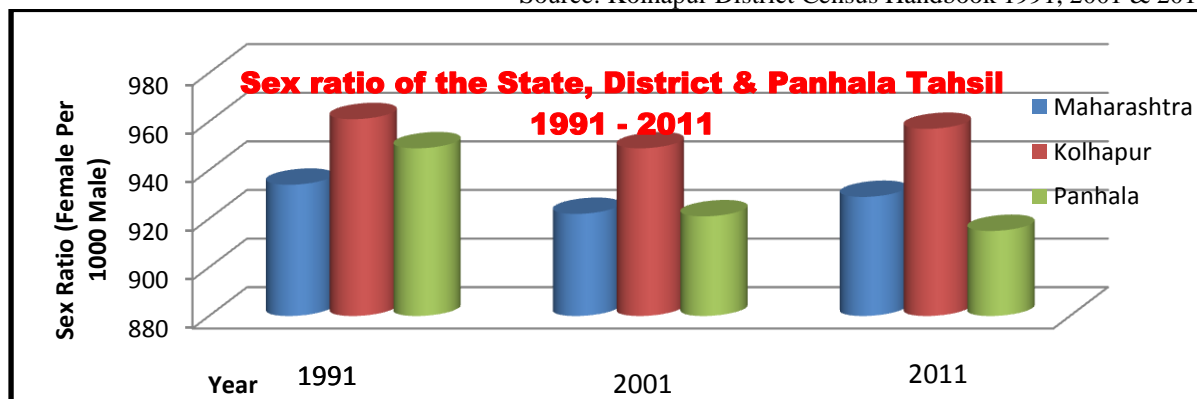
**Comparatively Study of Sexs Ratio 1991 – 2011**

Table No 1 and Fig No1 shows that State, District and Tehsil wise distribution of Sex Ratio from 1991 to 2011. According to census 1991, 2001 and 2011 Kolhapur district recorded highest sex ratio as compeer to State and Panhala Tehsil. In 1991 state recorded 934 female for per 1000 male, 922 in 2001 and 929 in 2011. It means that 1991 to 2001 sex ratio have been decreased from 12 female for per 1000 male but again in 2001 to 2011 sex ratio have been slightly increased from 7 female for per 1000 male.

**Table No 1**  
**Sex ratio of the State, District & Panhala Tehsil 1991 - 2011**

Sr. No	Circle	Year		
		1991	2001	2011
1	Maharashtra	934	922	929
2	Kolhapur	961	949	957
3	Panhala Tehsil	949	921	915

Source: Kolhapur District Census Handbook 1991, 2001 & 2011



**Fig no 2**

The districts have been recorded 961 female for per 1000 male in 1991 but in 2001 (949) sex ratio has been decreased from 12 Female from per 1000 male. In 2001 to 2011 sex ratio has been increased from 8 female for per 1000 male. In 1991 to 2011 Panhala tehsil sex ratio has been decreased from 949 to 915 female from per 1000 male. Panhala tehsil recorded 915 female for per 1000 male in 2011 census it is serious demographic problem.

**Circle Wise Distribution of Sex Ratio in Panhala Tehsil**

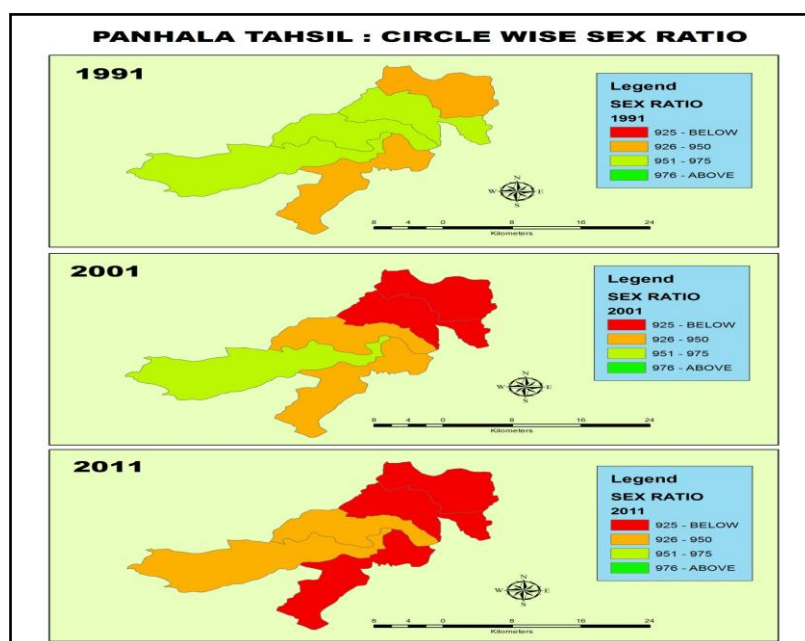
The table no 2 shows that circle wise distribution of sex ratio in Panhala tehsil according to 1991, 2001 and 2011 census. The average sex ratio of Panhala tehsil is 949 in 1991 followed by 921 and 915 in 2001 and 2011 respectively. There are 3 circles above district average (949), (921) from 1991, 2011 and 4 circles (915) from 2011. The Table No 2 have been shows that circle wise temporal variation of sex ration from 1991 to 2011. According to 1991, 2001 and 2011 census sex ratio has been decreased from last 30 year. In 1991 there are 949 female for per 1000 male and in 2011 these are recorded 915; it means that last 30 year 34 female have been reduced for per 1000 male.

**Table No 2**  
**Panhala Tehsil: Circle Wise Distribution of Sex Ratio 1991 - 2011**

Sr. No	Circle	Year			Change	
		1991	2001	2011	1991-2001	2001-2011
1	Kodoli	927	906	915	-21	9
2	Panhala	965	902	884	-63	-18
3	Kotoli	962	935	936	-27	1
4	Bajar Bhongaon	970	951	927	-19	-24
5	Kale	937	929	917	-8	-12
6	Panhala Tahsil	949	921	915	-28	-6

Source: Kolhapur District Census Handbook 1991, 2001 & 2011

The fig no 3 shows that circle wise spatio temporal changes of sex ratio in Panhala tehsil. In these map sex ratio has been categorised in to four categories viz. very low (Below 925), low (926-950), moderate (951-975) and high (Above 976). There are five circles in Panhala tehsil viz. Kodoli, Panhala, Kale, Kotoli and Bajar Bhogaon. In the categories of high (Above 976) sex ratio for per 1000 male; no anyone circle in these categories from last 30 year. In the moderate level categories there are three circles recorded in 1991 viz. Bajar Bhogaon (970), Panhala (965) and Kotoli (962). Only Bajar Bhogaon (951) in 2001 falls in these categories but there is no anyone circle in 2011 census. The low level sex ratio recorded Kale (937), Kodoli (927) in 1991, Kotoli (935), Kale (929) in 2001 and Kotoli (936) and Bajar Bhogaon (927) circles in 2011. The very low level sex ratio is found in Kodoli (906 and 915) and Panhala (902 and 884) circles from last two decade 2001 and 2011 respectively. Kale (917) is newly added in these categories from 2011.



**Fig No 3**

In table no 2 noticed that negative change of sex ratio in all circles. The ratio of highest no of female reduced in Panhala (-63) circle followed by Kotoli (-27), Kodoli (-21), Bajarbhogaon (-19) and Kale (-8) from 1991 to 2001. From 2001 to 2011 positive change are found in Kodoli (9) and Kotoli (1) circles; another three circles viz. Panhala (-18), Bajarbhogaon (-24) and Kale (-12) circles recorded negative change in sex ratio.

### Conclusion

1. In Kolhapur district recorded more female for per 1000 male as compeer to state and Panhala tehsil; it is 961 in 1991, 149 in 2001 and 957 in 2011. In 1991 to 2001 it is decreased (-12) but again in 2001 to 2011 has been increased (8).
2. The average tehsil level sex ratio has been decreased; it is 949 female from per 1000 male in 1991, 921 in 2001 and 915 in 2011.
3. The negative change have been recorded in all circles 1991 to 2001 but Kodoli and Kotoli circles sex ratio have been positively changed.
4. The due to Migration and Death rate Panhala and Bajarbhogaon circles facing serious problem of sex ratio.

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## Scope of Agro-Tourism

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### Abstract

*Agro-tourism is a tour to a working farm providing a fresh and live experience of various farm activities and agricultural background. It includes food, fun and farming apart from bullock cart rides and exposure to the rural set up. Agro-tourism could become a good support for additional and regular revenue to the local farmers and could also contribute to the social development through rural employment. Agro-tourism is the incorporation of tourism with agriculture. It promotes agriculture and allied activities as a tourism product. This paper is aimed at Concept of Agro-Tourism, Functions of Agro tourism, Scope of Agro Tourism, Socio aspect of Agro Tourism, Attractions of a Agro-Tourism Project, Features of Agro tourism, Key Techniques for Success In Agro-Tourism, Tourist Expectations Regarding Agro-Tourism, Various Products Provided by Agro Tourism.*

### Introduction

Agro-tourism is a rural enterprise which incorporates an operational farm along with a commercial tourism element. It has been practiced since many centuries but it was theoretically conceptualized in the last few decades. This concept was initiated and developed in Europe and North America, then to spread in many countries. In India it was initiated in 2005 at Malegaon village, near Baramati, Maharashtra by Agro Tourism Development Company (ATDC). The ATDC is promoting agro-tourism centres as well as initiating the development of concept of agro-tourism in India. It also caters to the needs of farmers by providing them training regarding skills and technical knowledge required to start and manage this venture at their farms.

### Concept of Agro-Tourism

Agro-Tourism is the term which related rural culture as a tourist attraction. It is the job generating activity. It is also increase the income of rural people. The tourism and agriculture is related with environment and society. 5. May – World Agro Tourism Day on 16th May.

Definition of Agro-tourism by Maharashtra Agriculture and Rural Tourism Federation (MART), is- It is the holidays concept of visiting farm or any agricultural, horticultural, or agribusiness operations for the purpose of enjoyment, education, or active involvement in the activities of the farm or operation. Agro-tourism is the place where the urban tourists come and spend their holidays in a village, it is the home giving a fill of rural culture. It gives the benefits to the farmers and villagers.

### Who can start Agro-tourism centres

The individual farmer can start Agro-tourism who have minimum two hector land, farm house, and water resource and is interested to entertain the tourists. Apart from the individual farmer, agricultural cooperatives institute, Non-Government organizations, Agricultural Universities, and agricultural colleges may start centers in their operational areas with the help of villagers and farmers. Agro-tourism is a way of sustainable tourist development and multi-activity in rural areas through which the visitor has the opportunity to get aware with agricultural areas, agricultural occupations, local products, traditional food and the daily life of the rural people, as well as the cultural elements and traditions. Moreover, this activity brings visitors closer to nature and rural activities in which they can participate, be entertained and feel the pleasure of touring.

### Functions of Agro-tourism

#### 1. Social psychological functions:

These include gaining new skills, meeting new people, reviving rural traditions and education. They are connected with increased respect for the rural community, the intermingling of rural and urban cultures and the opportunity to enjoy contact with the traditional lifestyle of the rural community.

#### 2. Economic functions:

These recession and promotion of social economic development with the stimulation of development of agricultural horticultural or animal breeding farms, generation of additional

sources of income both for rural households and for local or regional governments and communes.

### 3. Spatial and Environment:

Agro tourism is the development and transformation of elements of the natural environment. Spatial and environmental functions include the consequences of agro tourism for the natural and anthropogenic environments.

It gives tremendous economic impetus to a region in the form of creating employment avenues and increasing the standard of living of the under developed host community and it conserves the traditional cultural values with subtenants exposure to the world community. At the same time it provides security and advancement to the region.

#### Scope of Agro tourism

Agro-tourism has vast scope in the present context for the following reasons:

1. **Less expensive gateway** - The cost of accommodation, food, travel and recreation is very less in Agro-Tourism compare to any other type of tourism . Present concept tourism is limited to urban and rich class which constitutes very small proportion of the population. However, the concept of agro tourism takes travel and tourism to the larger population, this widens the tourist base by widening the scope of tourism due to its cost effectiveness.
2. **Have strong demand for wholesome family oriented activities** - Villages provide amusement opportunities to all age groups i.e. children, young, middle and old age, female, male, in total to the entire family at a cheaper cost. Rural games, traditional dresses, festivals, food and the nature provides variety of entertainment to the whole family.
3. **Curiosity about the farming and farmer lifestyle** - Almost all urban population having roots in villages, so they always have had the curiosity to learn or at least see about sources of plants, plants, animals, raw materials like handicrafts, woods. Rural lifestyle and their languages, culture, tradition,.
4. Agro-Tourism which generally revolves around farmers, villages and agriculture has the potential to satisfy the curiosity of this segment of population.
5. **Finding solace with nature friendly means** - Present urban lifestyle has made life stressful and brings average life span comedown. Hence, people are in continuous search of pro-nature means to make life more peaceful. Indigenous medical knowledge of villagers are must be respected. Ayurveda which is a pro-nature medical approach have its roots in villages.. Organic foods are in higher demand in urban areas and foreign countries. In totality, our health conscious urban population can look towards pro nature villages for solutions.
6. **Desire for peace and Interest in natural environment** - Busy and hectic urban life is an outcome of diversified activities and diversified thinking. Today every individual attempts to work more and hard, in different directions to earn more money and enjoy lavish life comforts. Hence, peace is always out of his system. They can look towards agro-tourism is a means for searching peaceful location. Peace and tranquility are inbuilt in Agro-Tourism as it is away from urban areas and close to nature. Crops, birds, animals, mountains, water bodies, villages provide totally different atmosphere to urban population in which they can forget their busy and hectic urban life.
7. **Disillusionment with resorts and illusionment with farm** - In the late 90's people use to visit resorts to get an peaceful and green environment but now the crowded peace seekers disturb each other's peace. Hence, peace is beyond cities and resorts. Hence, visit to villages satisfies their desire.
8. This is also expressed through the hatred of urbanites to flat culture and love for farmhouses located in the outskirts of cities. Any opportunity to visit villages and spend time with family is dream of any urbanite. But, minimum decent facilities are always problem. Agro-Tourism attempts to overcome this problem.
9. **Educational value of Agro-Tourism** – As we all know Indian economy is an agricultural driven economy. Agro-Tourism creates awareness about rural life and knowledge about agriculture science among urban children. It would be effectively used as educational and training tool to train agriculture and line department officers. It is a means for providing training to future farmers. This provides unique opportunity for education where learning is



fun effective and easy. “Seeing is believing, doing is learning”. This experience based concept is the USP of Agri- Tourism.

10. **Recreation of Villages** - Villages provide variety of recreation to urbanites through festivals and handicrafts. Villagers lifestyle, dress, languages, culture / traditions which always add value to the entertainment. Agricultural environment around farmers and the entire production process could create curiosity among urban taught. Agricultural products like farm gate fresh market, processed foods, organic food could lure the urban tourists. As result of this agri – atmosphere in the villages, there is scope to develop Agri – Tourism products like culinary tourism, agri-shopping, pick and own your tree or plot, bed and breakfast, pick and pay, camel riding, bullock cart riding, boating, fishing, herbal walk, rural games and health (ayurvedic) tourism.

### **Socio aspect of Agro Tourism**

Agro tourism programmes can help in community development. It helps building pride and confidence of the community. Better quality of life - Intensification and diversification of economic activities through agro tourism enhances the purchasing power of the community. No doubt, that improves the standard of living and ultimately quality of life in rural area. Cultural transformation – cultural transformation is possible through interaction with various guests / tourist of different caste, creed and communities. Strengthening the community institution - Also it is possible that agro tourism will strengthen the community institution specialization, networking and leadership. The services like schools, library, health care, ICT centers, public transportation etc. also gets developed due to agro tourism.

### **Attractions of a Agro-Tourism Project**

Fruit plantations tour, understanding the growth cycle pattern, fruit food values etc. Cow farm tour, includes visiting the milk processing unit, use of milk and its by-products. Sheep and goat farm tour, milk production and marketing. Silk farming (plantation of mulberry and silk worm rearing unit) and silk weaving/production unit. Farm equipment museum. Medicinal plantation tour, understanding the uses in day to day life. Demos on various modern methods of irrigation. Large nursery of mother saplings and various methods of propagating plants. Fertilizers and animal feed mixing units. Rural games including bullocks cart ride and tractor ride. Bee hiving demo farm, keeping of honeybees for honey production and for cross pollination purpose. Looking at alternative energy resources like solar, wind mill, bio gas and other unconventional modes of energy generation. Emu/ ostrich bird farm

### **Features of Agro tourism**

The establishment of Agro tourism units in the heart of India i.e. in rural places will have an impact on upliftment of socio-economic and livelihood status of the farmers. It will provide opportunities for- Conservation of plant biodiversity, Conservation of forest areas, Generation of additional revenue, Bringing economic diversity, Relationship building, Improve understanding of local farmers and their families, Upliftment of traditional business, Improving socio-economic status of farmers, Make a positive contribution, Promote local development, Increase environmental awareness, Provide visitors with personal experience of nature and culture.

### **Key Techniques for Success in Agro-Tourism**

Agro-Tourism is a one of the business activity. So, farmers have must of commercial mind and some marketing techniques for the success. Give a wide publicity of your tourism centre by new papers, television etc Use all possible advertisement means, Develop contacts with the schools, colleges, NGOs, clubs, unions, organizations etc., Train your staff or family members for reception and hospitality, Understand about the customers wants and their expectations and serve, Charge optimum rent and charges for the facilities/services on the commercial base, Do the artificially use local resources for the entertain / serve to tourist, Develop your website and update time to time for attract foreign tourist, Take their feedback and comments about the service and suggestions to more development and modification, Develop a good relationship with the tourist for future business and chain publicity, Develop different agro-tour packages of for different type of tourist and their expectations, Preserve a address book and comments of the visited tourists for future tourism business, Behave sincerely with the tourists and participate with them / him, Small farmers can develop their agro-tourism centres on the basis of cooperative society.

### Tourist Expectations Regarding Agro-Tourism

1. **Convenience Location:** Convenience is one of the important aspects in tourism business. People prefer convenient and assessable location. Easy to access is important aspect in agro tourism most of tourists expect this.
2. **Peace and Quiet:** Rural based location where peace and quiet is best location for the agro tourism centre because agro tourists expect the peace and quiet, opportunity to stay in a rural location and the access to experience of rural life.
3. **Clean and Green Environment:** Agro tourism is deferent from traditional or formal tourism therefore tourists or visitors expect clean as well as green environment in the agro tourism centre.
4. **Chance to be involved in the farm:** Activities that allow for participation in agricultural activities increases happiness of the tourists. Almost all visitors of agro tourism expect that farmers should allow participation in casual agricultural activities.
5. **Entertainment Value:** Entertainment of the tourists is essential in every type of tourism including agro tourism. Arrangement of festivals celebration and events based around rural culture, traditions, rural games, flock songs etc increases entertainment value.
6. **Participation in rural festivals:** Many tourists (urban people) have curiosity regarding to various rural festivals. They want to participate in these festivals but there are no such arrangements for them. Hence, they expect to participate in rural festivals.
7. **Purchasing opportunities:** Tourists want to purchase frees fruits, vegetables, plants and other agricultural production from farm site. They expect quality of agriculture products and fresh products in lower rates than products available in urban area.
8. **Interact with rural people:** There is opportunity to build relations with rural people and tourists visiting to agro tourism. Many urban people do not have relations with rural peoples but they want to establish relation with them. Therefore, they want to interact with rural people and agro tourism in an opportunity for this.

### Various Products Provided by Agro Tourism

Tourists opting for agro tourism are attracted towards agro tourism because of variety of innovative products which they cannot enjoy with traditional tourism. Thus agro tourism is getting very good response from urbanites. The innovative products provided by agro tourism are Visiting eating organic food, fruits items and enjoy pictures view of flowers, See water storage farm pond – Shet-tale, Sweet water fishing, Local / herbal tree plantation, Tour of farm, Various rides like – bedfellow, bullock cart, tractor, horse etc., Rod fishing, Dairy, piggery, poultry etc., Processing of farm products, Demonstration of farm activities, Wool processing, Cross country skiing, Special Events and festivals.

### Conclusion

Agro-tourism is a supportive system to the agricultural activities in India. It is an Innovative practices which can be utilized by the famer and farm owners to harvest this opportunity, through a diversified approach. It will be beneficial Model for both farmer and the tourist, as farmers have and extra edge for earning and employments where as the tourist gets an privilege to relive a smooth, clam and rejuvenating atmosphere and culture of our agricultural heritage. Although is a long way on go as the development and acknowledgement of the Agro-tourisms is potential seen and cultivated by only Maharashtra government and its supporting agencies. Agro tourism is complimentary to traditional agricultural activities. It is an opportunity for farmers to use the available resources in a diversified and innovative way. Farmers earn better from innovative use of available resources and the tourist can enjoy village life and nature in a affordable prices.

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## To Study The Trend Of Prices Of Potato In Shree Shahu Market Yard Kolhapur

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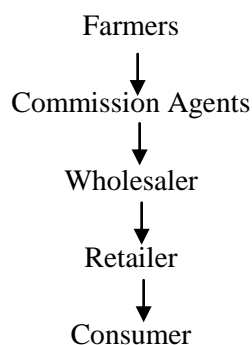
### **Abstract:**

*This paper is concern to the trend of prices of potato in Shree. Shahu Market Yard, Kolhapur. In this study researchers have derived result from five years data provided by the Market Yard Authority. Only secondary sources has been used for compiled the data from 2013-14 to 2017-18. Researchers have considered the prices of potato at minimum level, average level and maximum level of each month, which was decided through open auction system of Market Yard.*

**Keywords:** Prices, Potato, Market Yard, Trend and Open Auction System etc.

### **1. Introduction:**

In India most of the farmers are illiterate that's why they are exploited. This type of exploitation of farmers must be stopped and they should get maximum price of their agricultural produce. Thus, *Rajshree Chatrapati* Shahu Maharaj was established, 'Shri. Shahu Market Yard' in Selected District. And the farmers who are living in an around Selected District city they came and sale their produces with the help of commission agents. One reason also affected on price like market chain i.e.



This chain may also affect on price of potato i.e. farmers are came and sale their produces at open auction system with the help of commission agents. There is fixed rate of commission i.e. 6 percent to commission agents. Then the commission agents or traders either store it or sale it to retailer then retailer sale it to final consumer. So, the chain of farmers to final consumers is biggest problem for rising price. In this study researchers have focused on the trend of prices of potato in Shree Shahu Market Yard, Kolhapur.

### **2. Statement of Problems:**

1. What is the level of inward of potato in Shree Shahu Market Yard, Kolhapur?
2. What is the trend of prices of potato in Shree Shahu Market Yard, Kolhapur?

### **3. Objectives of The Study:**

The main aim of this research is to find out the truth which has not been covered as yet so the objectives of study are set out as follows,

1. To study the trend analysis of prices of potato.
2. To offer suggestions to overcome problems in pricing of agricultural produces, if any.

### **4. Research Methodology:**

#### **4.1 Technique of Analysis:**

Case study method has been adopted for analyze the trend of prices of potato in Shree Shahu Market Yard, Kolhapur. The data been processed with help of Microsoft Excel.

## 4.2 Methods of Data Collection:

### a. Secondary Data:

Present researcher has been collected data from newspapers, websites, books, internet and articles. Also collect data from record of Shree Shahu Market Yard Kolhapur for 5 years i.e. 2013-14 to 2017-18.

## 5. Significance of The Study:

1. This study is significant to the farmers to take appropriate price of agricultural produce.
2. This study is significant to the traders to know about the trend the price of selected agriculture produce.
3. This study is also significant to researchers who want to do further research in this area.

## 6. Analysis and Interpretation:

**Table No. 1**  
**Inward and Price of Potato in 2013-14**

Sr. No.	Months	Inward (in Quint.)	Minimum	Maximum	Average
1	April	35,932	600	950	850
2	May	47,548	570	900	730
3	June	37,861	600	850	750
4	July	42,274	500	950	700
5	August	36,886	400	850	700
6	September	38,018	600	1,100	1,000
7	October	27,311	500	1,100	900
8	November	32,127	400	1,250	1,000
9	December	51,842	500	1,300	1,000
10	January	47,815	500	1,300	900
11	February	47,324	500	1,150	1,000
12	March	48,961	400	1,000	800
<b>Total</b>			<b>400</b>	<b>1,300</b>	<b>800</b>

(Source: Records of Selected District Agriculture Produce Marketing Committee)

Table no. 1 indicates that the inward and price of potato in 2013-14. In the month of December inward of potato is very high i.e. 51,842 quintals and minimum, maximum and average prices in that month is Rs 500, Rs. 1300 and Rs. 1000 respectively. In the month of October inward of potato is very less i.e. 27,311 quintals. In the month of January and February the inward of potato is constant. High minimum price is determine in the months of April and September i.e. Rs. 600 and low price is determine in the months of August, November and March i.e. Rs. 400. In the month of December and January maximum prices are constant and high i.e. Rs.1300.

**Table No. 2**  
**Inward and Price of Potato in 2014-15**

Sr. No.	Months	Inward (in Quint.)	Minimum	Maximum	Average
1	April	44,549	500	1,020	850
2	May	52,270	500	1,100	800
3	June	46,586	600	1,000	850
4	July	42,743	600	950	850
5	August	55,911	500	950	800
6	September	47,996	600	1,000	770
7	October	43,672	500	1,000	800
8	November	49,526	400	1,050	760
9	December	55,030	400	900	700
10	January	45,670	400	850	750
11	February	51,632	500	850	780
12	March	48,892	400	1,100	850
<b>Total</b>			<b>400</b>	<b>1,100</b>	<b>750</b>

(Source: Records of Selected District Agriculture Produce Marketing Committee)

Table 2 shows that the inward and price of potato in the year of 2014-15. In this year inward of potato is less fluctuates. In the month of August the inward of potato is high i.e. 55,911 quintals and in the month of July the inward of potato is low i.e. 42,743 quintals. Minimum price of potato is



not more fluctuated because the price determine in the year is Rs. 400 per quintal, Rs. 500 per quintal and Rs. 600 per quintal in whole year. In the months of May and March the maximum price of potato has determined high i.e. Rs. 1,100 per quintal. The trend of average price of potato is Rs. 700 to Rs. 850 per quintal.

**Table No. 3 Inward and Price of Potato in 2015-16**

Sr. No.	Months	Inward (in Quint.)	Minimum	Maximum	Average
1	April	41,571	700	1,400	1,200
2	May	51,040	900	1,500	1,330
3	June	51,476	1,000	1,450	1,300
4	July	52,434	1,100	1,750	1,500
5	August	51,055	1,100	1,750	1,480
6	September	46,452	300	1,650	1,400
7	October	43,353	400	1,600	1,300
8	November	44,385	400	1,600	1,270
9	December	55,929	600	1,700	1,300
10	January	54,602	800	1,700	1,400
11	February	47,962	800	1,500	1,280
12	March	53,799	800	1,500	1,150
<b>Total</b>			<b>300</b>	<b>1,750</b>	<b>1,325</b>

(Source: Records of Selected District Agriculture Produce Marketing Committee)

Table 3 indicates that the inward and price of potato in the year of 2015-16. In this year inward is high in the month of December i.e. 55,929 quintals and low in the month of April i.e. 41,571 quintal. In the month of September the minimum price of potato is less i.e. Rs. 300 per quintal and the minimum price of potato is high in the months of July and August i.e. Rs. 1,100 per quintal. High maximum price has determined in the month of July and August i.e. Rs. 1750 per quintal. In this year average price fluctuate between Rs. 1,150 per quintal to Rs. 1,500 per quintal. In the month of July the average price more because of high inward in the same month. Here minimum price are more fluctuated.

**Table No. 4 Inward and Price of Potato in 2016-17**

Sr. No.	Months	Inward (in Quint.)	Minimum	Maximum	Average
1	April	61,043	1,000	1,650	1,200
2	May	59,960	1,000	1,900	1,300
3	June	54,582	1,000	1,800	1,415
4	July	56,455	1,000	1,700	1,300
5	August	61,256	1,000	1,600	1,240
6	September	49,595	500	1,500	1,000
7	October	40,877	600	2,050	1,200
8	November	44,388	1,000	2,800	2,000
9	December	53,536	500	2,500	1,920
10	January	55,116	400	2,100	1,150
11	February	50,521	200	1,500	1,100
12	March	52,762	400	1,700	1,300
<b>Total</b>			<b>200</b>	<b>2,800</b>	<b>1,340</b>

(Source: Records of Selected District Agriculture Produce Marketing Committee)

Table 4 indicates that inward and price of potato in the year of 2016-17. In the month of August the inward is 61,256 quintals i.e. high and in the month of October inward is low i.e. 40,877 quintals in the year. Minimum price is constant in the months of April, May, June, July, August and November i.e. Rs. 1,000 per quintal. And in the month of February minimum price is determine very low i.e. Rs. 2 per kilogram. Maximum price is very high in the month November i.e. Rs. 2,800 per quintal and low maximum price charge in the months of September and February i.e. Rs. 1,500 per quintal. And also average price is high in the month of November i.e. Rs. 2,000 per quintal.

**Table No. 5**  
**Inward and Price of Potato in 2017-18**

Sr. No.	Months	Inward (in Quint.)	Minimum	Maximum	Average
1	April	52,381	700	2,100	1,510
2	May	57,192	1,000	2,100	1,800
3	June	53,288	1,200	2,100	1,900
4	July	49,747	1,500	2,350	1,900
5	August	63,179	1,500	2,650	2,200
6	September	47,912	600	2,750	2,200
7	October	37,064	800	3,000	2,300
8	November	39,323	1,000	3,000	2,600
9	December	56,882	1,000	3,200	2,400
10	January	55,202	800	2,700	1,200
11	February	60,050	800	1,400	1,100
12	March	71,583	500	1,350	950
<b>Total</b>			<b>500</b>	<b>3,200</b>	<b>1,775</b>

(Source: Records of Selected District Agriculture Produce Marketing Committee)

Table no. 5 said about the inward and price of potato in the year of 2017-18. In the month of March inward is 71,538 quintals i.e. high that's why the minimum, maximum and average price are Rs. 500 per quintal, Rs. 1,350 per quintal and Rs. 950 per quintal it is very less in the year. High minimum price has charged in the months of July and August i.e. Rs. 1,500 per quintal and maximum price is high in the month of December i.e. Rs. 3,200 per quintal.

### 7. Findings:

1. In the year 2013-14 the minimum price is Rs. 400, average price is Rs. 800 and maximum price is Rs. 1,300 per quintal. (Table 1)
2. In the year 2014-15 the minimum price is Rs. 400, average price is Rs. 750 and maximum price is Rs. 1,100 per quintal. (Table 2)
3. In the year 2015-16 the minimum price is Rs. 300, average price is Rs. 1,325 and maximum price is Rs. 1,750 per quintal. (Table 3)
4. In the year 2016-17 the minimum price is Rs.200, average price is Rs. 1,340 and maximum price is Rs. 2,800 per quintal. (Table 4)
5. In the year 2017-18 the minimum price is Rs.500, average price is Rs. 950 and maximum price is Rs. 1,350 per quintal. (Table 5)

### 8. Suggestions:

#### 8.1 to Farmers:

1. It is suggested to the farmers that, if in the market the price is very low of potato then they should come together and maintain one wear house and store potato for some days and when price rise then they should bring the produce in the market.
2. They should know about the previous year demand and supply of the selected agricultural produces with the help of this base they can produce that much production or round about that then it will benefited for them for getting maximum price. And it is benefited for price stability.
3. It is suggested to the farmers that they should come together and discuss about price, how much quintals of produces they have to produce then they will get maximum price of their produces.

#### 8.2 to market yard authority:

1. It is specially suggested that on the basis of cost cultivation the market yard authority should fix or determine the minimum price for selected agricultural produce. And authority should not allow to the commission agents and traders to go below the predetermined the standard price. Which will help for recovery the minimum cost made by the farmers.
2. When production of potato is very low then market yard authority should watch on commission agents and traders who will store the produces and should control on them.

### 9. Conclusion:

It is concluded that in the year of 2016-17 the minimum prices of potato was very low i.e. Rs. 200 per quintal. In the same year the maximum prices of potato was very high i.e. Rs. 2,800 per quintal and in the year of 2014-15 the average prices of potato was very low i.e. Rs. 750 per quintal.

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## To Study The Scenario And Scope Of Agri-Tourism In Maharashtra

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### Abstract

*Researchers have focused on the importance of agro-tourism development in Maharashtra and identify the problems and make suggestions to establishment agro-tourism. Researchers intend to focus on Scenario and Scope of Agri-Tourism in Maharashtra. Agritourism is a concept of developing and preparing villagers for creating an alternative Source of earning and sustaining their heritages. This kind of tourism develops where agricultural activities and tourist interacts. It involves various agricultural activities, animal rides and stay at rural surroundings with natural and fresh cuisines. The paper aims to show the growing importance of the tourism offer in rural farms in terms of growth and sustainable development of the economy in Maharashtra. For the collection of data researcher has used secondary source. The study is analytical and descriptive in nature. Secondary data required for the study are collected from books, journals and other periodicals and reports of the Government and other agencies.*

**Keywords:** Agro-Tourism, Farm activities, Agriculture activities.

### 1. Introduction:

Tourism is now known as an engine of growth in various economies of the world. Many countries have changed their economy by developing their tourist potential. The ability of tourism to create a large number of jobs and additional income sources for skilled and inefficient people is the potential for tourism. Today the concept of traditional tourism has changed. Some new areas of tourism have emerged as agro-tourism. People will get direct and indirect benefits because of tourism development. Agriculture & Tourism is an innovative agricultural activity related to tourism and agriculture. Farmers have the ability to create additional resources for income and employment opportunities. Maharashtra is one of the major tourist centers in India and there is a large opportunity to develop agricultural tourism.

#### 1.1 Introduction Of Agritourism:

From today, major developments in agrotism worldwide are being seen different types of agrotimism are observed. Agritourism gives people the chance to breathe fresh air, learn about rural environment, ride horses, pick fruits, feed animals, Milk cows and participate in actual work of farm and buy produce directly from a farm. Agro-tourism is an unusual tourist type in which agriculture is used as a tourist destination for educational and recreational purposes. MART has accepted the concept of Agritourism as the practice of attracting travelers or visitors to rural areas which are used primarily for agricultural purposes. Agritourism center is the location where tourists from the urban areas can come and spend their weekends or holidays in a village with agricultural atmosphere at a very economical cost, it is the home away from home giving a personal feel of harmony with rural culture. Agritourism integrates agriculture with pleasure and gives the benefit of agriculture and tourism activities to the tourists that deliver economic benefit to concerned farmer and villagers.

#### 1.2 Concept of Agro-tourism:

A term 'Agro-Tourism' is a new face of tourism. An agro-tourism is farm based industry that is open to the community. Agro - tourism is defined as "Travel that combines agricultural or rural settings with products of agricultural operations all within a tourism experience". "Agro-Tourism is that Agri-Business activity, when a native farmers or person of the area offers tours to their agriculture farm to allow a person to view them growing, harvesting, and processing locally grown foods, such as coconuts, pineapple, sugar cane, corn, or any agriculture produce the person would not encounter in their city or home country. Often the farmers would provide a home-stay opportunity and education". Agro-Tourism and Eco- Tourism are closely related to each other. Eco-Tourism provides by the tour companies but, in the agro tourism farmers offer tours to their agriculture farm and providing entertainment, education and fulfilled experiences for the urban peoples. Agro-tourism is a way of sustainable tourist development and multi-activity in rural areas through which the visitor has

the opportunity to get aware with agricultural areas, agricultural occupations, local products, traditional food and the daily life of the rural people, as well as the cultural elements and traditions. Moreover, this activity brings visitors closer to nature and rural activities in which they can participate, be entertained and feel the pleasure of touring.

## **2. Statement of the Problem:**

Since Agritourism business started from the year 2005 in Maharashtra, farmers in the Maharashtra adopted agritourism as part of a diversification strategy to increase income, it is important for farmers to clearly understand agritourism. Study of tourist's expectation and satisfaction factors is essential to grow this industry in the future. Few researchers who had studied agritourism business and made conclusions were mostly derived from secondary data. Moreover, studies of tourists' attitude towards this business were not studied.

## **3. Objectives of The Study:**

- 1) To look at the importance of agro-tourism development in Maharashtra.
- 2) To identify the problems and make suggestions to establishment agro-tourism.
- 3) To Study Scenario and Scope of Agri-Tourism in Maharashtra

## **4. Research Methodology:**

Every research is necessary a specific methodology so for the present research has used specific methodology. For the collection of data, the researcher has used the secondary source. The study is analytical and descriptive in nature. Secondary data required for the study are collected from books, journals and other Government websites, periodicals, and reports etc.

## **5. Significance of The Study:**

It is important from viewpoint of agricultural community i.e. farmers and the government regarding study of agritourism that if it is to be used as a dominant diversification option for sustaining the viability of the agricultural sector and rural communities. The study is restricted and related to agritourism business in Maharashtra. It covers the study of agro-tourism centers (ATC) in Maharashtra and study of expectations of tourists who visited it. This research study highlights on related concepts of agritourism, scope and obstacles in development of it in Maharashtra.

## **6. Limitation of The Study:**

The major limitation of this research is that the present research is related to only the agro-tourism in Maharashtra. The conclusion of this research may not be applicable to other sector.

## **7. Agro-tourism Potential in Maharashtra:**

Maharashtra is the third largest state in terms of area and population. It is situated on the western coast of India, with a 720 km coastline in Green Konkan region. There are many mountainous terrains situated in the Western Ghats and Sahyadri mountain ranges and reservoirs with semi-evergreen and ripe forests. There are several tourist centers in Maharashtra which are aided natural environment for the centers of agriculture tourism in Maharashtra. There are 22368 thousand agricultural commodities in Maharashtra and 36122 thousand cows, Beefalo, goats etc. in the agriculture. Main crops include rice, jowar, millet, wheat, pulses, turmeric, onion, cotton, many oil seeds. Peanuts, sunflower and soybeans Mango, banana, grapes and oranges etc. under fruit cultivation.

Maharashtra has got rich and diverse cultural heritage. There are many communities of different religions in the state and many festivals paint Maharashtra's culture with festal pride. Some popular seasons celebrated those are Deepawali, Ganesh Chaturthi, Gudi Padwa, Dasara, Nag Panchami, Gokul Ashtami, Narli Purnima, Pola, Makar Sankranti, Banganga Festival and Holi etc. in Maharashtra. More than 4.11 (43% of the total population) lives in urban areas. Maharashtra will be a consumer of agriculture-tourism centers in rural areas. Apart from nature and culture, there is enough roads and rail connectivity in rural areas. There are many tourist spots in Maharashtra from ancient cave temples, narrow beaches, ancient forts and monuments, forests and wildlife, unique hill stations, pilgrimage centers, centers and festivals, rich tradition of art and culture. About 25 such places have been identified for the rural tourists in Maharashtra. Thus, all the districts of Maharashtra have tourism potential. Some useful elements help in tourism in Maharashtra.

- 1) Tourism places already exist to support Agro-Tourism
- 2) Good communication and transportation facilities
- 3) Green house plantation, flowers, vegetables, fruit etc.



## 8. Difference Between agro-tourism and Tartionaltourism:

Agro-tourism is also a tourism business but it is defeated by general tourism because it has the foundation of agriculture and rural life style. Tourism is also available to enjoy natural places and to enjoy some heritage. However, agriculture-tourism is a tourist which includes experience, education and cultural changes. This is very important following the following from the usual tourism.

- 1) It provides pollution and noise free sites for travel and tourism at rural background.
- 2) The cost of food, accommodation, recreation and travel is minimum in agro-tourism
- 3) Agro-tourism can satisfy the curiosity of urban peoples about sources of food, plants, animals, and industrial agro-raw materials.
- 4) It provides information about the rural handicrafts, languages, culture, tradition, dresses and lifestyle.
- 5) A family environment at the tourist place, is one of the most important characteristics in the agro- tourism
- 6) In the agro-tourism, tourists not only see and watch agriculture farms but also they can participate in the agricultural activities and experience the farming.
- 7) It provides natural situations to watching, Birds, animals, water bodies etc
- 8) Agro-tourism could create awareness about rural life and knowledge about agriculture it also provides opportunity for education through experience of farming and knowledge about the rural life including entertainment. Agro-tourism is an instrument of urban-rural connectivity through the tours.

## 9. Problems of The agro-tourism in Maharashtra:

The Maharashtra has a greater potential of the development of the agro-tourism centres due to the good natural and climatic conditions. But there are some problems in the process of agro-tourism development in the state. Major challenges and problems are follows.

- 1) Lake of perfect knowledge about the agro-tourism
- 2) Weak communication skill and lake of commercial approach of the small farmers
- 3) Lake of capital to develop basic infrastructure for the agro-tourism
- 4) Ignorance of the farmers regarding to such type of activities
- 5) Presence of unorganized sector in the Agri-Tourism industry.
- 6) Ensuring hygiene and basic requirements considering urban visitors
- 7) Lakhs of farmers have small size holding, low quality land and little or no access to credit or irrigation. Have to negotiate with consistent drought.
- 8) 148 of the 355 Talukas in the state are consistently drought prone

## 10. Who Can Start Agro-tourism Centers:

The individual farmer can start agro-tourism who have minimum two hector land, farm house, and water resource and is interested to entertain the tourists. Apart from the individual farmer, agricultural co-operatives institute, Non-Government organizations, Agricultural Universities, and agricultural colleges may start their centres. Even Grampanchayats can start such centres in their operational areas with the help of villagers and farmers.

## 11. Requirements for agro-tourism Centers:

Researcher has identified the minimum requirements for the agro-tourism centre. To develop an agro-tourism in their farm, the farmer and farmers must have basic infrastructure and facilities in their farm as follows.

## 12. Infrastructure Facilities:

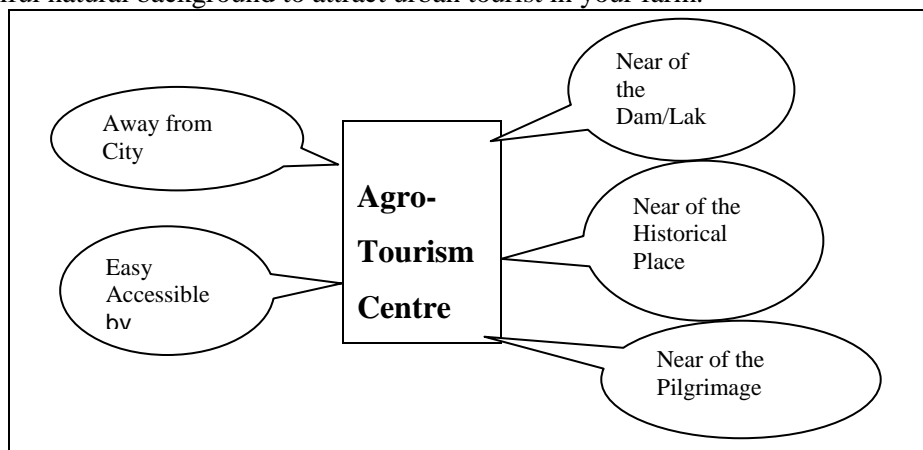
- 1) Accommodation facilities at same place or alliance with nearest hotels.
- 2) Farmhouse, which has the rural look and feel comfortable along with all minimum required facilities.
- 3) Rich resources in agriculture namely water and plants at the place.
- 4) Cooking equipments for cooking food, if tourists have interested.
- 5) Emergency medical care's with first aid box.
- 6) The well or lake or swimming tank for fishing, swimming
- 7) Bullock cart, cattle shade, telephone facilities etc
- 8) Goat farm, Emu (Ostrich bird) farm, sericulture farm, green house, etc.

### 13. Facilities are Provided:

- 1) Offer authentic rural Indian / Maharashtra food for breakfast, lunch and dinner.
- 2) Farmers should offer to see and participate in the agricultural activities.
- 3) Offer an opportunity to participate in the rural games to the tourist
- 4) Provide information them about the culture, dress, arts, crafts, festivals, rural traditions and also give possible demonstration of some arts.
- 5) Offer bullock cart for riding and horse riding, buffalo ride in the water, fishing facility in your pounds or nearest lake.
- 6) Offer fruits, corns, groundnuts, sugarcane and other agro-products as per availability
- 7) Show local birds, animals and waterfalls etc and give authentic information about them.
- 8) Must provide safety to tourists with the support of alliance hospitals.
- 9) Arrange folk dance programme, Shekoti folk songs bhajan, kirtana, lezim dance, dhangari gaja, etc.
- 10) Make available some agro-product to purchase to the tourist

### 14. Location for the agro-tourism centres:

Location is most the important factor for success in the agro-tourism. The location of the Centre must easy to arrive and have a good natural background. Urban tourists are interested into enjoying the nature and rural life. So, farmers should develop their centre in the rural areas only which have a beautiful natural background to attract urban tourist in your farm.



The place of agro-tourism centre must be easy accessible by roads and railways. Tourists want to enjoy some historical and natural tourist places along with the agro-tourism. Hence, the centre should be developed near of these tourist places. It is more beneficial to both tourist and farmers. The places which are already tourist centres like Mahabaleswara, Panchgani, Nashik, Jotiba, Narshinghadi, Pandharpur, Akkalkot, Konkan etc. These are the better places for the development of agro-tourism. Other than these places farmer can develop their centres in any affordable places.

### 15. Benefits of agro-tourism Centers:

Agro-Tourism has the potential to change the economic face of traditional agriculture. The benefits of agro-tourism development are manifold. It would bring many direct and indirect benefits to the farmers and rural people. Some of the benefits are following:-

- 1) Employment opportunities to the farmers including farm family members and youth
- 2) Additional income source for the farmers to protest against income fluctuation.
- 3) Cultural transformation between urban and rural people including social moral values
- 4) Farmers can improve their standard of living due to the contacts with urban people.
- 5) Benefits to the urban people, they can understand about the rural life and know about the agricultural activities.
- 6) It support for rural and agricultural development process.
- 7) Help to the reduce burden on the other traditional tourist centers.

### 16. Conclusion:

Maharashtra has a great potential to the development of agro-tourism, because of natural conditions and different types of agri products as well as variety of rural traditions, festivals. More than 45 percent of population is live in the urban areas and they want enjoy rural life and to know

about the rural life. It is a good opportunity to develop an agro-tourism business in Maharashtra. But there is a problem of low awareness about this business in the farmer and problem of the finance and proper view in the farmers of the Maharashtra. Hence, the agriculture departments of the districts. Agriculture Universities should try to give orientation about it and provide some innovative ideas regarding to the agro-tourism. The government should try to provide optimum financial aids to the agro-tourism activities in the Maharashtra by the grants and institutional finance. Bank should provide optimum financial help for the agro-tourism activities in the Maharashtra. Union of the agro-tourism service providers is also another need of these farmers which helps to the agricultural tourism network in the India including Maharashtra.

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## Famines –Agriculture-Farmer’s Suicides A Case Study Of Marathwada

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### Abstract:-

*Suicides by the farmers are a burning issue in Maharashtra specifically in Marathwada region of Maharashtra. The arid climate of a Marathwada region and drought like conditions influences the yield from agriculture. Low yield and low price lead farmer to an economical distress. To overcome economical necessities he borrowed credit from moneylenders and other sources which become a trap for him and the resulting frustration drove him to commit suicide. The present paper throws light on consequences and causes of suicides. The total study is based on field visit, interviews with the farmers and data obtained from various documents, reports and newspaper articles.*

**Keywords :-** Agrarian crisis, Droughts, Crop failure, Debt and Economical distress.

### Introduction :-

Agriculture is the backbone of India’s Economy. More than 50% population is engaged in agriculture and its related activities and it accounts for 10% India’s gross domestic product. But now a days Indian agriculture passing through lots of problems like lack of investment , crop failure , lack of irrigation, minimum support price , natural calamities like droughts and many more.

In the view of above, a study on suicides by farmers in Maharashtra, specifically in Marathwada region of Maharashtra has taken as research topic for this paper.

By the record of India’s national Crime Record Bureau , in the past 20 years nearly 300,000 farmers have committed suicides in the country. In the year 2018 , first three months of the years ( January , February , March ) records 696 suicides in Maharashtra . This farmers belongs to 3 regions of the state via ; Marathwada ( arid belt ) , North Maharashtra and West Maharashtra( the sugar belt ) . From this three regions Marathwada shares the highest number of suicides . ( The Times of India article )

The Marathwada is known as the arid belt of Maharashtra. Now it famous as ‘ Suicide belt of Maharashtra and the whole Maharashtra is stepping towards becoming the ‘Suicide Capital of India’.

Any Suicide is regrettable for a country & its people. But why did farmers commit suicides in such a huge numbers?

The agriculture in an India and a state is at the mercy of monsoon and thus it is highly vulnerable. The Marathwada region lies in the rain shadow zone of the state. The low amounts of rainfall lowers the yield. Which is not compensated by highest prices. Thus the farmers suffers from low yield low price & high cost of production & trap in to this cycle which finally push him in to debt which leads to the suicide. This phenomenon is known as agrarian crisis.

The present study throws lights on the following factors ;

- Drought conditions responsible for low production.
- The demographic characteristic of a region.
- Temporal & spatial distributions of incidence of suicides.
- Age wise distribution of suicides.
- Major reasons of suicides.

To achieve this , research paper will be divided in to 3 parts.

### Data collection :-

The study was conducted in Marathwada region of Maharashtra, which includes 8 districts via ; Aurangabad , Jalana , Parbani , Nanded , Hingoli , Latur , Beed and Osmanabad.

The data have been collected through primary as well as secondary sources.

Primary data was collected by the interviews with the farmers. The structured questionnaires was designed for this purpose . Around 200 cases have been taken in to consideration for the study.

The secondary data were collected from various governmental and non governmental reports , news papers articles . The data of population were collected from census of India and District socio-economic review.

**Methodology :-**

Intensive filed operation were carried out to collect information and evidences relating to suicide by farmers. Data like landform and land use characteristics ,land-water feature and the data about socio-economic aspects related to agricultural activity were collected. In the field survey discussion and interaction with the local community to understand the real problem have been carried out.

Physiography of the region is studied with the help of topographical maps and field observations. Climatic data were collected from various sources . Data about population and economic criteria and occupational structure was collected from Census of India and district Socio-Economic Review.

Collected data were analyzed by using various statistical techniques & then represent it with the help of tables, charts and diagrams.

The research method involves comparing and interpreting the data collected from field survey and data obtained from various documents , literatures etc.

**Part I**

Part I deals with the analysis of drought conditions and the Demographic characteristics of study area

**A) Analysis for the Drought**

To examine the drought conditions in study area , the total analysis of amount of rainfall and its district wise distribution were carried out.

Table shows that the total rainfall in the year 2014 was 6017.30 mm , figure goes declining in the year 2015. It was 5254.13 mm and in the year 2016 it was 6251.99 mm . Average figure for the year 2014, 2015, and 2016 were 752.16 mm , 656.77 mm 7 781.49 mm resp. Hingoli received highest rainfall among all the other 7 district followed by Nanded. Osmanabad and Beed district received low rainfall. The rainfall is distributed unevenly through out the area.

Almost 3/4<sup>th</sup> of the area covered by the agricultural land hence drought is having significant impact. As water is key ingredient of development , the low and uneven distribution of rainfall creates drought like condition in this region

(Table no.1) **Distribution of Rainfall in Marathwada** (In mm)

District	2014	2015	2016
<b>Aurangabad</b>	583.98	374.88	675.46
<b>Jalna</b>	572.00	742.20	688.31
<b>Parbhani</b>	847.83	633.45	774.62
<b>Nanded</b>	940.31	661.12	955.54
<b>Hingoli</b>	1143.28	1248.93	892.76
<b>Latur</b>	561.00	762.06	802.13
<b>Beed</b>	647.65	435.10	686.36
<b>Osmanabad</b>	721.25	396.39	776.81
<b>Total</b>	6017.30	5254.13	6251.99
<b>Average</b>	752.16	656.77	781.49

(Source : District Socio-Economic Review of Concern Districts and Concern Years)

**B) Analysis of the Demographic characteristics of a region**

The study area acquires approximately 64,590 km<sup>2</sup> land and support the total population 18727718.

The study region includes 8 districts. There are 64 towns and 8495 villages. Aurangabad has maximum population followed by Nanded .The sex ratio is higher in Parbhani followed by Nanded . (Table No.2)

For the study of occupational structure , the workers are divided in to 3groups viz ; Main workers,Marginal workers and Non-workers. (Table No.3)

From main workers category around 2782851 are agricultural cultivators . 2553607 are agricultural labours . around 111674 workers engaged in manufacturing services and household industries and 1562135 are engaged in other types of work.



From marginal workers,151018 are agricultural cultivators,331489 are agricultural labours , 27464 are engaged in manufacturing services and household industries and 195698 workers engaged in other type of works. There are total 9150740 are non-workers.

(Table No. 2) **Marathwada Population 2011**

District	Population	Towns	Villages	Sex Ratio	0 to 6 Age
<b>Aurangabad</b>	3695928	16	1372	917	848
<b>Jalna</b>	1958483	04	967	929	847
<b>Parbhani</b>	1835952	08	830	940	866
<b>Nanded</b>	3356566	13	1575	937	897
<b>Hingoli</b>	1178973	03	710	935	868
<b>Latur</b>	2455543	05	950	924	872
<b>Beed</b>	2585962	07	1357	912	801
<b>Osmanabad</b>	1660311	08	734	920	853
<b>Total</b>	<b>18727718</b>	<b>64</b>	<b>8495</b>	-	-

(Table B.1- Marathwada Total Population; Source- Census of India – 2011(Maharashtra)

(Table No.3)

**Occupational Structure in Marathwada Division -2013**

Sr No.	Main Workers				Marginal Workers				Non Workers
	Agricultural Cultivators	Agricultural Labours	Manufacturing Services and Others Workers		Agricultural Cultivators	Agricultural Labours	Manufacturing Services and Others Workers		
1	281771	288438	10939	175269	13259	29368	2271	21482	1013289
2	398646	261713	12844	171289	20306	39224	3861	23003	1028160
3	281771	288438	10939	175269	13259	29368	2271	21482	1013289
4	416826	539588	23448	337929	30997	92807	5710	46648	1867339
5	227284	198494	6967	81626	14329	27989	1301	11192	608163
6	311209	383939	14476	254553	20571	32639	3187	26283	1407339
7	581109	327830	16800	228969	25171	45736	4293	25640	1329501
8	284235	265167	15261	137231	13126	34358	4570	19968	883660
<b>Total</b>	<b>2782851</b>	<b>2553607</b>	<b>111674</b>	<b>1562135</b>	<b>151018</b>	<b>331489</b>	<b>27464</b>	<b>195698</b>	<b>9150740</b>

(source : District Socio-Economic Review of Concern Districts and Concern Years)

**Part II**

Part II deals with the analysis of suicides

**Farmers suicide Scenario**

In order to understand the causes of suicides , it is necessary to note ;

- 1) Temporal Distribution of suicides . (Table No. 4)
- 2) Spatial Distribution of Suicides.(Table No.5)
- Age Wise Distribution of Suicides.(Table No.6)

(Table No.4)

Year	No.of Suicides	Year	No.of Suicides
<b>2006</b>	2376	<b>2012</b>	1473
<b>2007</b>	2076	<b>2013</b>	2297
<b>2008</b>	1960	<b>2014</b>	2568
<b>2009</b>	1605	<b>2015</b>	2002
<b>2010</b>	1741	<b>2016</b>	3228
<b>2011</b>	1518		

District	No. of Suicides (June,July,August)
Aurangabad	35
Jalana	18
Parbhani	49
Nanded	53
Hingoli	21
Latur	30
Beed	164
Osmanabad	52
<b>Total</b>	<b>422</b>

(Table No 5)

Age	% of Suicides
20 to 30	32
31 to 40	38
41 to 50	19
Above 50	11

(Table No.6)

It is observed from table no.4 that the year 2016 shares the highest number of suicides(total 3228 ). The number of suicides per year are consistently increasing except in the years 2009 , 2010 , 2011, 2012 . In this year figure shows some decline but after that it goes on increasing.

Table no.5 shows that the highest number of suicides was in Beed district(164) followed by Osmanabad.

It is observed from the table no. 3 that the number of suicides between 31-40 age group is more (38) than any other age group. The age group 20-30 shows 32 suicides which is little less from the figure of 31-40 age group.

### Part III

Part III deals with the major causes behind the suicides and conclusion . To find out the causes of suicides , following hypothesis are set as;

#### 1) Recurrent failure in Agriculture is the cause of suicide

To test the Hypothesis comparison between the total land hold by farmers and the average production from last4 years was taken in to consideration.

From table no.7 it is observed that the percentage of suicides are more (47.2 ) in land holder having 6 to 10 Acres land. The percentage of suicides for 11 to 15 hectares land holder is 29.0% and the production is 9200,11000,67000 and 50000 for the 2011,2012,2013 and 2014 respectively.The less number of suicides are observed from the land. Less people(0.1) and from the land holders who have more than 16 acres of land (2.1) From the above analysis it is concluded that the medium land holders always gets very less production & faces recurrent problems. Hence the hypothesis is proved.

Holding in Acres	No. of Respondants in Percent	Production in 2011 (In Rupees)	Production in 2012(In Rupees)	Production in 2013(In Rupees)	Production in 2014(In Rupees)
Land less	00.1	-	-	-	-
1 to 5	22.6	22000	22600	14500	12000
6 to 10	47.2	28500	40000	24600	32000
11 to 15	29.0	92000	110000	67000	50000
16>	2.1	100000	155000	48000	36000
<b>Total</b>	<b>100</b>	-	-	-	-

(Table No.7)

**2) Scarcity of water has resulted in life end.**

(Table No.8)

Land in Acres	No. of Respondents in per cent
< 1	73
1 to 2	22.5
2 to 3	4.0
> 4	0.5
Total	100 %

(Table No.9)

% of failure	No.of Respondents in per cent
No failure	00
< 25	6
26 to 50	22
51 to 75	28
Total failure	44
Total	100

For the testing of this hypothesis the total land under irrigation & failure rate in irrigation was taken in to consideration. Table shows that there are total 44 Failures due to the inadequate facility of irrigation . Hence hypothesis is proved.

**3) Sugarcane Phobia tends towards suicide**

To tests this hypothesis the types of crops and percentage of suicides for per type of crop was taken in to consideration.

Basically the climate and soil type of region is supportive to the crops like cotton , soyabin , Grains , pulses etc. But in recent years , the area cultivated sugarcane is increasing. Sugarcane is a tropical crop and consumes high amount of water . But the misimpression from western Maharashtra’s development due to sugarcane factories tends people from Marathwada to yield sugarcane in their farm which became a big failure for the region.

Table no. 10 shows 67.40% farmers committed suicides who yields sugarcane in their farm. The percentage for the other crops are as following -Cotton -22.10, Soyabin – 7.25, Grains 3.25 Figure shows that the hypothesis is proved.

Crop	Percent of Suicide
Sugarcane	67.40
Cotton	22.10
Soya bin	7.25
Grains	3.25
Total failure	44
<b>Total</b>	<b>100</b>

(Table No.10 )

Details	Percentage of Respondents
Drinks	12
Gamble	5
Adultery	7
All types	16
None of these	60

(Table No.11)

**4) Addiction tends towards suicide.**

An inadequate resources ,illiteracy , economical distress ,pressure from society frustration leads people towards the addiction.

To find out , is addiction may one of the reason for the suicide? Data werw Collected and tabulated.(Table No.11)

From above table it is observed that addiction is not a main reason for suicides. Hence the Hypothesis was not proved.

**5) Increasing debts has spoiled way of living.**

(Table No. 12)

Outstanding Debts	Per cent of respondents
Private Money	28
Coop Society	45
Banks	13
All types	14

(Table No. 13)

Amount	No of Respondents
< 50,000	18
51000 to 100000	23
100001 to 500000	46
500001 >	14

Farmers borrow credit for their agricultural as well as consumption purposes. He borrowed it from private money lenders , cooperative societies , and Banks and from the other sources .

Table shows that the percent of respondents as per sources from where he borrowed outstanding debts. It is observed from the table that farmers give preferences for cooperative societies.

The increasing debt is also the main causes for suicides. The above table shows the percentage of respondents as per the increasing amount of debts. 46 respondents are observed from the table who have debt more than 10000 up to 500000.

Hence the hypothesis is proved and we can conclude that the outstanding debts has exhausted life .

It is also noted in report on the ‘Farmers suicides in Maharashtra : A overview Government of Maharashtra’ that , indebtedness and its attendant economic distress is the proximate reason behind the suicides by farmers

### 6) Negligence by Everyone has Pressurized to Commit Suicide

Constant pressure from society , banks and from unauthorized moneylenders , family member lead to severe mental distress , compromising their dignity and resultant frustration drove the self respecting farmers to commit suicides. From table no.14 we can see that the 51 respondents are from negligence by family category.

Details	Percentage of Respondents
Negligence by Govt. officers	11
Negligence by financers	26
Negligence by Society	14
Negligence by family	51

### Conclusion-

Almost 75% farmers suicides have occurred amongst the farmers with land holding between 6 to 10 hectors. The incidence of suicides is almost negligible amongst the landless labors. Farmers who have committed suicides primarily included those who relied on mono-cropping specifically sugarcane and those with little or no irrigation facilities and those who did not have supplementary occupation. The droughts conditions argument by the increasing debts, failure of crop yield , economical distress worsened the condition more and more . Beed , Osmanabad districts are most suffers in terms of rainfall and water availability followed by Latur.

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## Tackling Methods To Minimize Intensity Of Drought In Drought Prone Region Of Sangli District

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### ABSTRACT

*Drought is one of the most insensitive phenomena of nature which impacts on every sector of the nature. Agriculture is one of the most vulnerable sectors to drought conditions in all over the world. The western part of the Sangli district is highly influenced by such conditions and similarly the agriculture and social life of the region is mostly affected by the drought. This paper deals with the some of the tricks to tackling the drought conditions. Which are successfully implanted in the various parts of the region all over the world. These techniques are very useful to create the excessive need of water for region. About 70 percent area of the study region is influenced by the drought prone conditions. And near about more than 5357 km sq area and 10 lack populations is facing the droughts averagely every five years. By using some techniques like surface storage creation, prevention of evaporation losses from reservoirs, equitable distribution, maintenance of irrigation systems etc for some extent the drought conditions can be tackled.*

**Key Words:** Drought, Agriculture, Water, Storage, Irrigation etc..

### Introduction

Drought is a disaster in slow motion covering large areas. It is characterized by deficient supply of moisture due to sub-normal rainfall or irregular distribution of rainfall or higher water need due to high temperatures or combination of all the three factors. Lack of rains over extended period of time affecting various human activities, results in widespread crop failure, unreplenished ground water resources, depletion in lakes / reservoirs, etc. As drought affects many economic and social sectors, quite good number of definitions has been developed by various disciplines. Sangli district is one of the regions who came under the drought conditions. Large area of the district specially northern and western is largely affected by the drought conditions. About seven tehasils of Sangli district are facing the problem of the drought in averagely every 3 to 4 years. Agricultural sector of the district and industries depended on the agriculture are affected by this phenomena.

### Objective

To understand the methods of tackling for minimize drought impact of the drought prone region of the Sangli district.

### Study Region

Sangli district is district of Maharashtra state located in the western part of Maharashtra. Sangli District lies between the 16° 45' N to 17° 22' N latitudes and 73° 42' E to 75° 40' E longitudes and it cover 8572 sq.km. area. Sangli city is the district headquarters. It is bounded by Satara and Solapur districts to the north, Bijapur District (Karnataka) to the east, Kolhapur and Belgaum (Karnataka) districts to the south and Ratnagiri District to the west. Sangli district is situated in the river basins of the Warna and Krishna rivers. Other small rivers, such as the Warana and the Panchganga, flow into the River Krishna.

### Data Source And Methodology

This research paper is purely based on the secondary data. The secondary data will be gathered from district agricultural office, research articles and also gotten from different websites and internet etc. There is no empirical touch to this paper.

### Limitations Of The Study

This study region comprises seven tahasils which are largely affected by the drought prone conditions. So some time the conclusion and application of this research work is not in favour of some tehasils and this paper is purely based on the secondary data.

### Tackling Drought Through Water Management

Mean annual rainfall over the district is around 359 mm, out of which about 90 percent rainfall occurs at the four monsoon months of the year. This rainfall varies widely from and year to year and season to season. Some of the tehasils of the district receive as much as 500 millimetres (mm) or more like walwa and shirala. Part of Jath, Kavathe-Mahankal, Atpadi and Khanapur gets only 200 mm or even less. Low rainfall leads to dry situation which continue almost throughout the year. Nearly 60 percent area of the district is arid and 20% is semi-arid due to the variability of



rainfall in space and time, semi-arid regions are subjected to the problems of drought. The problems of arid area are one good crop not possible in normal years due to scanty rainfall.

Water management and water conservation measures are need to achieve a strong and stable economic base, especially in the dry and drought prone areas of the district. There are no general solutions possible to avoid or keep away this phenomenon. It has also to be remembered that improvement of drought prone areas cannot be structured on the lines of the development of other favourably placed areas. The pattern of development of the drought-prone areas will have to be quite different from than others.

Following are some of the methods or techniques that might be practised to reduce the impact of drought prone condition on agricultural, social or economic levels.

### **Surface Storage Creation**

Conventional way to water conservation has been to go in for water development projects creating reservoirs by structuring dams and canals for supply water wherever and in whatever amounts desired. We have to practice for creation of more storage. But, this is not the solution for the large spatial and temporal variations in rainfall. Many river basins like Krishna, Yerala, Man have already exhausted the available water resources. In many other basins, water is fast becoming inadequate. In other hand construction of dams and canals has become costly proposition. This is partly due to the increase in the basic cost of construction and partly due to the necessity to tackle more complex projects involving difficult foundations etc.

### **Planning For Less Dependable Yield**

For the drought areas, planning of average flows or 50 percent dependability has been recommended by many Commission and Committees to increase the availability of water mainly for the agricultural purposes. Minor irrigation tanks are already being planned for 50 percent dependability.

### **Prevention Of Evaporation Losses From Reservoirs**

In summer months it is observed that shallow tanks having large surface areas located in the drought affected areas lose nearly half the water storage by evaporation. To prevent water from evaporating in a critically water short region, an appliance of a layer of chemicals like cetyl, stearyl and fatty alcohol emulsions can effectively retard evaporation and savings in the field can be around 40 percent of the normal evaporation losses. To create greenery by planting the various trees are also good for the reduction of the evaporation rate of the region.

### **Water Adjustment**

The trend of refilling reservoir or the ground water position for a water year gets fairly known by the middle of August. Re-adjustment of sanctions and releases has to be carefully carried out at this time keeping a close watch on the behaviour of the monsoon. The modern management techniques using probability investigation may help in assessing the situations of 'supply-variability' in the drought areas.

### **Reduction In Conveyance Losses**

Reduction in conveyance losses is an important fact in the management of water. Due to leakage are found to vary widely in an irrigation system ranging from 35 percent to 45 percent of the diverted water. Canal linking system could be an appropriate step to protect this exact resource in such a condition. Considering the towering quantity of losses in arid summer months, running a canal system in the drought areas during the hot dry months will not be an economical proposition. It will be better to transfer as much water during the monsoon months thereafter and to store water in small ponds or tanks near the point of utilization for later use during the summer months.

### **Equitable Distribution**

Many of the existing canal systems are not able to supply an adequate and equitable quantum of water to all the farmers in the command areas. A rotating system of supply of water if stringently implemented will not only meet the ends of equity but will also economise use of water. Lack of adequate control actions in the canal systems also adds to the problem of fair distribution of water. Another important aspect of water administration is the prevention of loss of water to drains during shipment from outlet to field. This can be eliminated by farmers active contribution in water distribution and maintenance of distribution system in good shape.

## **Maintenance Of Irrigation Systems**

Over the years, repairs of irrigation systems has deteriorated mainly due to the fact that water tariff charged are not sufficient for carrying out the maintenance for keeping the system fit and efficient. Whole range of activities covering procedure, schedule maintenance, special and major maintenance, replacements etc. are now covered under “ maintenance” and finances are allocated to it from non-plan. Unless adequate allocations are earmarked for maintenance of irrigation systems, gradual corrosion of the existing irrigation systems cannot be controlled.

## **Better Irrigation Practice**

On smallholding irrigation practices existing in the country also result in surplus of water leading to poor irrigation efficiency. Most farmers still irrigate as their predecessors did hundreds of years ago by flooding or channelling water through parallel furrows. Absence of field channels for adapting to field irrigation adds to the problem. Simple measures like levelling of the fields so that water gets more evenly distributed can greatly improve the performance. Wastage due to absence of field channels and lack of field levelling are now being eliminated through the Command Area Development (CAD) programmes.

## **Irrigation Scheduling**

Better irrigation scheduling practices can also improve the irrigation efficiency. For example, it is now well established that water is required more at critical stages of crop growth and water stress during other period has negligible impact on yields. Addition watering don't add proportionately more to the yield. Greater attempt should be made to prepare farmers in the use of irrigation scheduling methods appropriate to their mode of production. Agricultural conservatory programmes could help spread the profit of these water management techniques.

## **Cropping Pattern**

Better water organization involves all stages i.e. from pre-project formulation to operation and safeguarding. In the project formulation stage, a suitable cropping pattern in conformity with soil and climatic conditions taking into account the farmers preferences should be evolved. While designing the canal capacities, peak demand of water in critical periods by the high yielding varieties of crops should be kept in view.

## **Conjunctive Use Of Surface And Ground Water**

The concept of conjunctive use of ground water and surface resources is very necessary especially in deficiency areas in order to increase the production per unit of water. The manner of using ground water and surface water varies considerably from place to place. Where ground water availability is not good, canal water can be mixed in suitable proportion. Conjunctive use makes possible same flexible of cropping pattern in the canal command. For the proper water management, it is necessary to treat command areas as one composite unit and two resources should be judiciously managed to achieve optimization of benefits. Costs of exploiting the two sources vary considerably and efforts are necessary to lay uniform charges for providing irrigation to serve the area in an optimal manner and to achieve maximum food production. The concept of conjunctive use has been successfully implemented in various States. Conjunctive use of surface and ground water supplies needs careful planning on more scientific lines to attain full benefits particularly in all drought management programmes.

## **Watershed Development**

Planning of watershed development involves an integrated approach upon physiographic and hydrologic characteristics which include construction of soil conservation works on crop lands; Construction of structures, like check dams, Nalla bunding, contour bunds, Gully plugging, percolation tanks, development of rainwater harvesting and construction of wells etc.

## **Creation Of Large Storages**

While planning various projects particularly in the regions depending on rainfall, it is preferable to go in for large storages rather than a large number of small storages on the tributaries, since small tanks are particularly vulnerable to drought. This is also essential in view of the fact that about 80 percent of the river flow occurs only during the four monsoon months and this flow requires

being stored for irrigation and power generation. It means the water shortage problem may be solved to a great extent by creation of more storage.

### **Integrating Of Reservoirs**

Of late, there are persistent demands to abandon the schemes of large storages as it is feared that they cause environmental disaster leading to non-sustainable development of water resources. Instead, number of small reservoirs are being advocated to replace a single large reservoir. However, in many cases, a group of small schemes may not provide the same benefits as a large project can. It is, therefore, very important that minor schemes are integrated with the canal systems of major reservoirs.

### **Water Relocation From Surplus Basins To Deficit Basins**

A permanent long term solution to drought problem may be found in the basic principles of transfer of water from surplus river basins to areas of deficit. For this purpose, it is essential to take an overall national view for the optimum utilisation of available water resources. With this aim in view, Ministry of Water Resources and Central Water Commission have formulated a national perspective plan for water resources development which consists of Peninsular Rivers Development.

### **Conclusion**

To avoid the drought is not possible in reality but to minimize its intensity and impact is possible in some extent in various dry regions. The techniques discussed above are practised in various parts of the country and the world which reflects the intensity of drought has been reduced to some extent so it is very necessary to apply one of these methods to reduce the impact of drought in Sangli district. Some of the techniques are not too much costly so it can be practised by large number of peoples. The water table of region, reservoirs, lakes, ponds, streams and sub streams of region can be re arranged and water capacity can fulfilled by such ways. Study region have potential to use the various methods discussed above. Need to make awareness among the drought victims is essential.

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## Scope Of Agro Tourism

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### Introduction :-

Agriculture is a most important part of Indian economy and Tourism is now well recognised as an engine of growth in the various economies in the World. Several countries have transformed their economies by developing their Tourism potential. Tourism has great capacity to generate large scale employment and additional income sources to the skilled and unskilled. Now Today the traditional tourism has been converted. Some new styles and areas of the tourism have been emerged its name is Agro tourism promotion of tourism and related several things.

Today Agro tourism is playing important role agriculture activity. It has a great capacity to create additional source of income and employment opportunities to the farmers. Maharashtra is one of the best tourist centre in the India is large scope and great potential to develop agro tourism.

### 1.0 Objectives :

- To examine the important of agro tourism development in Maharashtra and India.
- To define a sustainable framework for the of agro tourism centres in the view of marginal and small farmers.
- To identify the problems of the agro tourism centre and make suggestion to establishment and operation of agro tourism.

### 1.1 Importance Of The Study :

- Agriculture is a important occupation in the India including in the Maharashtra But today it has become unprofitable due the irregular monsoon prices fluctuation of Agro products and some internal weakness of the agriculture sector.

### 1.2 Concept Of Agro Tourism :

- A Term Agro Tourism is a new face of tourism An agro-tourism is farm based business that is open to the public. This specialized agro tourism destinations generally offer things to see, things to do and produce or gifts to buy and one open to the public.

Agro tourism is a way of sustainable tourist development and multi activity in rural areas. Through which the visitor has the opportunity to get aware with agriculture areas agricultural occupation, local products traditional food and the daily life of the rural people as well as the cultural elements and traditions moreover, this activity brings visitors closer to nature and rural activities in which they can participate be entertained and find the pleasure of touring.

### 2.0 Location For The Agro Tourism Centres :

Location is most important factor for success. The agro tourism. The location of the centre most easy to arrive and have a good natural background. Urban tourists are interested in enjoying the nature and rural life. So farmers would develop their centre in the rural areas only which have a beautiful natural background to attract urban tourists in your farm. The place of agro tourism centre must be easily accessible by roads railways. Tourists want to enjoy some historical and natural tourist places along with the agro tourism. Hence the centre should be developed near of these tourist places it is more beneficial to both tourists and farmers. The places which are already tourist centres in Maharashtra.

### 2.1 Benefits Of Agro Tourism Centre:

Agro Tourism has the potential to change the economic faces of traditional agriculture. The benefits of agro tourism development are manifold. It would bring many direct and indirect benefits to the farmers and rural people. Some benefits are following.

- 1) Cultural transformation between urban and rural peoples including social moral values.
- 2) Employment opportunities to the farmer including farm family members and youth.
- 3) It support for rural and agricultural development process.
- 4) Additional income source for the farmers to protect against income fluctuation.
- 5) Help to reduce the burden on the other traditional tourist centre.

### 2.2 Suggestion Some Techniques for Success in Agro Tourism:

Agro Tourism most the business activity so farmers have must of commercial mind and some marketing techniques for the success in the for the better success in the Agro tourism.

- 1) Train your staff or family members for reception and hospitality.
- 2) Give a wide publicity of your tourism centre by new papers, television etc use all possible advertisement means.
- 3) Understand about the customers wants and their expectations and serve.
- 4) Do the exticialy use local resources for the encertain / serve to tourist.
- 5) Preserve address book and comments of the visted tourist for future tourism business.

#### **Conclusions :**

Maharashtra has a great potential to the development of agro tourism because of natural conditions and different types of agri products as well as variety of rural traditions, festivals. More than 45 percent of population in live in the urban areas and they want enjoy rural life and to know about the rural life its good oppourunity to develop an agro-tourism to develop and agro-tourism business in Maharashtra. But there is a problem of low awareness about this business in the farmer.

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## Commercial Sugarcane Farming through using Modern Agriculture Techniques

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### Abstract:

*Indian people main occupation is agricultural production. In India various crops produced food items and non food items. In a food items includes sugarcane, oilseeds, potatoes, grow pulses and non food items includes tea, coffee, cotton, rubber, and jute. Rice and wheat highly produced by Indian farmers. In top ten countries includes fishing business in India.*

*The Indian farmers were using traditional techniques for farming the various crops. Similarly sugarcane farmers have using the traditional techniques for production. But farmers have facing the higher cost of production and received low revenue from production of sugarcane. If farmers have using the new technology is for solution to number of problems. The new technology has increases the production with low cost and generates the higher revenue from sugarcane. The Walwa taluka is famous for Sugarcane production. The maximum farmer's cultivates higher production of sugarcane. But one drawback is growth of sugarcane cultivations is not free from land because of soils degradation and reduces the productivity. The maximum farmers have using the traditional techniques for sugarcane cultivation hence, the cost of production increased and benefits are decreased.*

*Hence, researcher choosing the subject studies of using modern techniques in farming sugarcane.*

**Key Words:** agricultural, sprinkler, Power tillers, Sugarcane harvester, Drip Irrigation

### Introduction:

The Walwa taluka is famous for Sugarcane production. The maximum farmer's cultivates higher production of sugarcane. The walwa taluka benefited from left irrigation on water resources from Krishna River and Warna River. The Sugar factories have been supply credit facilities by providing left irrigation project. The impact on left irrigation is maximum farmers taking production of sugarcane. But one drawback is growth of sugarcane cultivations is not free from land because of soils degradation and reduces the productivity. The maximum farmers have using the traditional techniques for sugarcane cultivation. The farmers unplanned are using the water, maximum use of chemical fertilizer etc. The cost of production increased and benefits are decreased.

The farmers are modern techniques used for production. The using modern technique prepares land for production; prepare water planning using drip system, modular sprinkler, limited using the chemical fertilizers etc. The farmers analyze or examine the soils contains for sugarcane production. The various techniques were available for agricultural production.

### Research Methodology:

It is a Case Study. A case taken for the study is a progressive farmer from Islampur Dist Sangli Named Ashok Khot. He has 50 years old. He uses 7 acres farm land for cultivation of sugarcane. He doing no of experiment in his land for increasing production in sugarcane. The number of expert persons, officers in agricultural department gives guidelines for increasing production.

The data collected for the study is primary as well as secondary. The primary data is collected through interview of the farmer and through observation. The secondary data is collected from books, journals, and website etc.

**Objectives:** The study is made with following objectives:

- 1) To study the cost of sugarcane production.
- 2) To study income of sugarcane.
- 3) To make suggestion if necessary

**Significance of the Study:** The present research paper will help to the sugarcane farmers for the overall improvements of their practices and it is also valuable to the other farmers.

**Scope of the Study:** The present research study is applicable to only sugarcane farmers. The study is mainly concerned on theoretical and practical aspects of sugarcane farmers in walwa Taluka.

### Analysis & Interpretation of Data

The data collected from the farmers is regarding the cost of sugar cultivation which includes fixed cost as well as variable cost and revenue form sugarcane. The data is related to 30 Gunta farming in sugarcane. The researcher assumes cultivation land and water is owned by the farmer. There is not cost included in the fixed cost.

**Fixed Cost:** The following table shows the various fixed expenses.

Sr. No.	Type of Fixed Expenses	Total cost of 30 Gunta	Percentage of Total
1	Invented modular sprinkler,	110000	9.21
2	Pipeline	20000	1.67
3	Electric Pump	50000	4.18
4	Farm Equipment(Power Teller, Big Tractor)	1000000	83.68
5	Seeds	15000	1.26
	Total	1195000	100

Source: Primary Data

**Variable Cost :**

The following table shows the various variable expenses.

Sr. No.	Type of Fixed Expenses	Total cost of 30 Gunta	Percentage of Total
1	Labour	9000	8.34
2	Fertilizers	50000	46.34
3	Electricity	15000	13.90
4	Interest of fixed capital 10%	11950	11.10
5	Depreciation 10%	11950	11.05
6	Diesel, Petrol	10000	9.27
		107900	100

Source: Primary Data

**Income from Sugarcane Farming:**

Sr. No.	Particulars	Rs.
1	Income of Sugarcane (90 ton * 2800per ton)	252000
2	Total cost (30 Gunta)	107900
3	Profit per crop	144100

Source: Primary Data

**Without using modern Technique production of sugarcane:**

**Expenses:**

The following table shows the various expenses.

Sr. No.	Type of Expenses	Total cost of 30 Gunta	Percentage of Total
1	Water Rent	10000	9.43
2	Seeds	15000	14.15
3	Labour	9000	8.49
4	Fertilizers	50000	47.17
5	Electricity	15000	14.15
6	Cultivation Charges	7000	6.61
	Total	106000	100

**Income from Sugarcane Farming:**

Sr. No.	Particulars	Rs.
1	Income of Sugarcane (40ton * 2800per ton)	112000
2	Total cost (30 Gunta)	106000
3	Profit per crop	6000

Source: Primary Data

Farmers using modern technique receivable high income as compare to the without using modern technique. It means farmers benefited from using the modern technique.

**Modern Techniques**

**Tractor:** Tractor used for land preparation for sugarcane cultivation. If land is unlevelled then this land should be levelled with the help of tractor. The sugarcane plantation should be done by tractor. The very less cost do the multipurpose operation in sugarcane cultivation.

**Power tillers:** Power tiller has used for multipurpose devices for sugarcane cultivation, which can perform fertilizers application, land preparation etc.

**Drip Irrigation:** Drip irrigation using for the growing the crops and saving the water. The drip irrigation system delivers water and nutrients directly to the crop roots, in the right amounts and right time.

**Motor pump:** Motor pump is a water deliver machine. This pump delivers water at sugarcane plantation land.

**Battery Spray Pump:** Battery Spray pump is a device used to spread a liquid. For growing the sugarcane uses various liquid. These liquid spray the pump.

**Sugarcane harvester:** A sugarcane harvester is a large piece of agricultural machinery used to harvest and partially process sugarcane. Today this machine is very famous for sugarcane harvesting.

**Best Sprayer Power Tiller:** This machine used for inter crop cultivation. They are also effectively used in weed control in dry and semi-dry fields.

**Advantages of Modern Techniques:** Using modern technique following advantages has received by the farmers.

- 1) Testing of Soil quality for planting crops.
- 2) Farmers aware about which technology more beneficial for farming.
- 3) Use good quality seeds.
- 4) Government supply subsidies to new modern techniques they can use farmers.
- 5) Modern irrigation system can help to save water like drip irrigation.

#### **Suggestions:**

A modern technique used for cultivation of sugarcane is profitable to the farmers. To make this farming minimize the weaknesses the following suggestions are given.

- There is need to impart training to the farmers.
- Proper farm accounting practices should be implemented to understand cost and profit of sugarcane farming.
- Improvement in infrastructural facilities is necessary.
- Supply adequate credit facilities with low rate of interest for improvement sugarcane cultivators.
- Continuously aware the modern techniques available in the market.

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## Role of GIS in Travel & Tourism Digital Guide Development

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### Abstract:-

The 21st century is the era of information technology and most of the work is done via smart devices like computers, laptops, mobile phones, etc. Integrating GIS with Travel & Tourism makes fine actionable decisions that are based on real world data. As a result, people are having some leisure time from their work and they want to utilize this time by visiting places around the world. They are in continuous search of places where they can spend quality times with their belongings. And the complete solution is the combination of Travel & Tourism with GIS. According to geographic database for tourism, GIS utilizes the hypothesis.

### Introduction:-

Travel & Tourism (T&T) with Geographic Information System (GIS) are two terms having common properties and that is the potential benefit of the combo any country across the world can have in the sustainable development of T & T industry. GIS is widely used technology in the T & T planning, development, and decision making now a days. No matter how big or small the geographic regions of the nation GIS is applicable at everywhere and bring lot many benefits with its applications.

### Application of GIS in T & T Development

Spatial data refers to the location related information on the earth's surface, which is normally communicated in the form of coordinate system or in the form of degrees of latitude and longitude. Travel & Tourism is worried with going among close and inaccessible places and maps are a vital guide for each of these spots, hence it is more worried with maps and topographical data than different ventures. Maps of travel courses and general data about the regions to visit are utilized as a part of selecting the goal, arranging travel and settlement and so forth. It is suitable to state that utilizing Internet and other most recent innovations for managing gathering, making, breaking down or controlling the cartographic information and maps have been consolidated together in a framework known as GIS. This is a superior apparatus in managing tremendous area particular spatial and non spatial information, and subsequently, simple to sort out and mechanize the information that can encourage organizers, authorities and overall population in arranging, advancement and advertising of tourism movement. Initial move towards the development of digital guide for T & T is to automate the tourism business in India. Second important step is to develop a user friendly guide system for foreign tourist as well as for local tourist. As T & T is a huge sector or comprises many interrelated components, the GIS can be categorized into two parts: The Management & Tourist. The management user is responsible for overall development of the GIS which includes analysis, planning, Development, Testing, Marketing, etc. On the other side, tourist is the user of this system who can use it for searching the location while on tour to find out specific type of place like nearby restaurants, hotels, airports, etc. Following is a figure showing the GIS categorization.

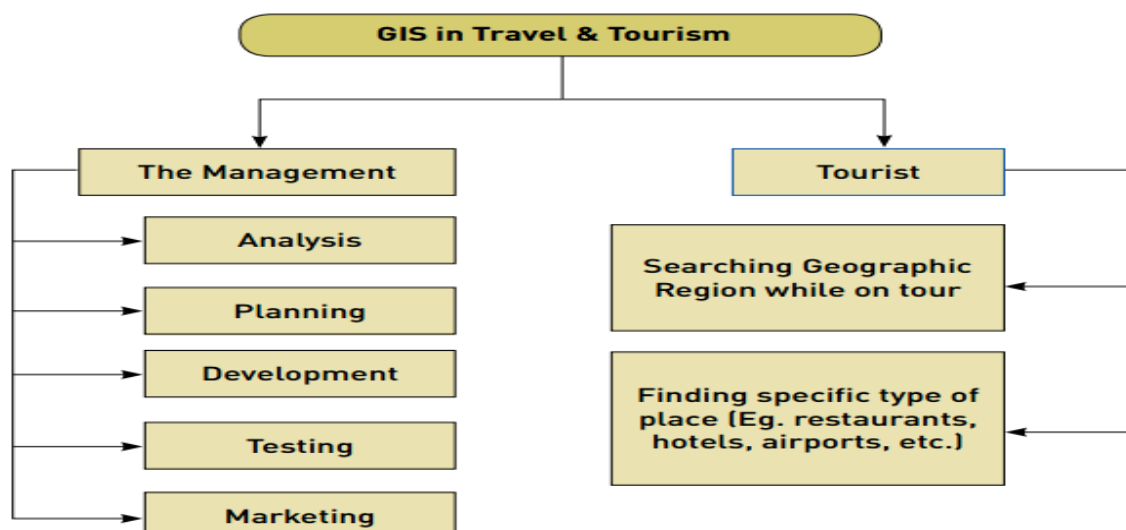


Fig 1. : GIS Categorization in Travel & Tourism

### Development of Travel & Tourism Information Digital Guide

Tourism industry includes numerous organizations that are straightforwardly or in a roundabout way required in giving administrations to the voyagers. Tourism is viewed as one of the biggest financial assets to a nation's income. It is a wellspring of outside money for creating nations as it includes portability of sightseers to and starting with one place then onto the next. Tourism has various tangible and intangible components as an administration industry. Major tangible components incorporate transportation, convenience and different segments of hospitality. Real immaterial components identify with the reason or inspiration for turning into a traveler, for example, rest, relaxation, chance to meet new individuals and experience different societies, or essentially to accomplish something else and enterprise. For going amongst close and distant spots, maps are required as imperative devices for giving exact areas.

Travel & Tourism Information Digital Guide proves to be useful by giving an interface from where the client can specifically choose or inquiry the data they require from or to the guide. Individuals can indicate their ranges of intrigue and after that take a gander at the data depicted in a guide. Else they can likewise tap on the intuitive useful guide and get the trait data about the purposes of enthusiasm from the guide database.

Following are the needed components for digital guide for T & T:

1. Data
2. Other GIS Components
3. GIS software development Tool

**1. Data:** Development of digital guide for tourist needs two types of data. Spatial data & Non - Spatial Data.

**Spatial Data:** Spatial data includes the data which is in the form of latitude & longitude, data in the form of coordinate system.

**Non - Spatial Data:** This includes information regarding geographic history of tourist attractions of the city, services and facilities were acquired from various resources such as tourism related websites and from other relevant agencies departments.

**2. Other GIS Components:** The necessary components involved in the development of digital guide are: Client, Web Server, Map Server, and Data Server.

**Client:** This is a Web interface with HTML and structures a basic customer of digital guide. As this sort of interface has exceptionally restricted client intelligence, accordingly it is impractical for the clients to communicate with the spatial questions and maps. Keeping in mind the goal to overcome from this issue and give the client an interface to communicate with the spatial information.

**Web Server & Application Server:** Web server and application server constitutes the second segment of the digital guide. A Web server is likewise called as the HTTP server. The HTTP server is in charge of answering to the solicitations from the customers. The Web server can answer in a few approaches to the customer by sending the current HTML records or the guide images; or by passing solicitations to and conjuring different projects that can procedure the request. Application server gets demands from the Web server. At the point when the Web server gets a demand that should be prepared by some other program, it passes the solicitations to the Application Server which thus hunt down the separate relevant application program e.g. delineate and afterward passes on the demand to process it. The application server goes about as an extension or connector between the Web server and the guide server.

**Information Server:** An information server is in charge of keeping up the spatial and in addition non-spatial information in a social or nonsocial database structures. The information server reacts to the solicitations sent through the SQL by a customer or the guide server for the required information, and along these lines additionally called as a SQL server.

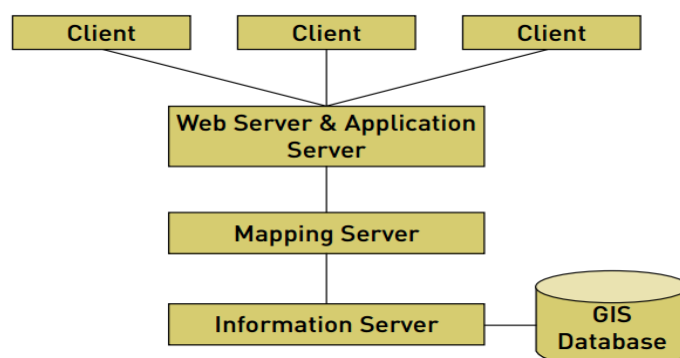


Fig 2. : Components of T & T Digital Guide



**GIS Database:** This is the essential component used to store data regarding geographic locations. It stores the data in form latitude, longitude or in coordinate system. It is having the additional functionalities like querying, searching, editing, etc.

**Mapping Server:** This is a noteworthy workhorse segment that satisfies spatial questions, conducts spatial investigation, and creates and conveys maps to the customer in light of the client's demand. Delineate plays out the GIS capacities or administrations, for example, inquiry sifting, information extraction, geocoding, spatial examination, outline, and so forth. Results from the guide server are both of the two structures - highlight information sent to the customer for control by the client or a straightforward guide picture in a realistic organization.

**GIS software development Tool:** MapInfo company's windows programming improvement toolbox MapXtreme 2005 permits .NETexperienced designers to make intense area upgraded desktop and customer/server applications. In support of Microsoft's .NET Framework for Windows, MapXtreme mirrors a solitary question display for creating or amplifying mapping applications for the desktop, conventional customer/server situations or the Web. MapXtreme is an application advancement device for information representation and mapping for better business choices, administration of benefits and operations all the more viably. GIS based digital guide development comprises of parts, for example, information advancement, information association and application improvement that are not comparative MapInfo company's windows programming improvement toolbox MapXtreme 2005 permits .NETexperienced designers to make intense area upgraded desktop and customer/server applications. In support of Microsoft's .NET Framework for Windows, MapXtreme mirrors a solitary question display for creating or amplifying mapping applications for the desktop, conventional customer/server situations or the Web. MapXtreme is an application advancement device for information representation and mapping for better business choices, administration of benefits and operations all the more viably. GIS based digital guide development comprises of parts, for example, information advancement, information association and application improvement that are not comparative but rather not quite the same as the standard programming advancement ventures. Yet at the same time, there are similarities in the improvement procedure in surveying client necessities, framework prerequisites and different parts of advancement. There are various systems of programming improvement. The prototyping model is one of those and gives input from the client amid improvement prepare as opposed to toward the end. This empowers the engineer to approve prerequisites and determinations before usage of the framework which ought to spare the assets of the venture in the event that the outcome is undesirable. Along these lines, prototyping life cycle prepare model is taken after to build up the online GIS application.

## Conclusion

This article is an endeavour to study the role of GIS in the development of digital guide based on GIS. This incorporated online data framework can help the travelers from far goals to investigate city visitor exercises and choose their visit in a fitting way by performing on-line GIS inquiries, examination and all the solution related to geographic question.

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