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**Address**

• Vikram Nagar, Boudhi Chouk, Latur.  
• Tq. Latur, Dis. Latur 413512 (MS.)  
• (+91) 9922455749, (+91) 8999250451

**Email**

• aiirjpramod@gmail.com  
• aayushijournal@gmail.com

**Website**

• www.aiirjournal.com

**CHIEF EDITOR – PRAMOD PRAKASHRAO TANDALE**

**Crop Concentration & Diversification in Gadchiroli District of Maharashtra**

**Sunil V. Sunatkar**

Department of Geography

[sunatkar@gmail.com](mailto:sunatkar@gmail.com)

**Abstract:**

*Agriculture is the dominant sector of Indian economy, which determines the growth and sustainability. About 70 per cent population still relies on agriculture for employment and livelihood. The present study is an attempt to explain the crop concentration and diversification in agriculture of Gadchiroli district of Maharashtra. Here, a detail study has been done to know the dominating crop as well as ranking of the crops in the cropping pattern of the study area. Agriculture production is influenced by physical, climatological, socio-economic, technological and organization factors. An Endeavour is made here to study crop concentration and diversification regions in Gadchiroli District for year 2015-2016. This is normal year for agriculture phenomenon in this district. Administrative the district is divided in to 12 tahsils. Physiography, temperature, rainfall, soil and drainage influence on agriculture land use pattern in this district. Temperature is high in summer. Because of district is located in drought prone area of Maharashtra. Rainfall varies between 1100 to 1400 millimeters rainfall from west to east in entire district. The district is categorized as Tribal and undeveloped district and most of the land is covered with forest and hills. Forests cover more than 75.96 % of the geographical area of the district. This district is famous for Bamboo and Tendu leaves. Bhatia's method, the crop concentration indices for all blocks of the district have been calculated for crops like Paddy, Jwar, Tur, Mung, Maize etc. are the major crops. Crop diversification indices have been calculated by using Jasbir Singh's method for all the blocks of the district. Gadchiroli district occupies eastern part of Maharashtra state. It occupies an area of 14,412 sq.km. And supports 10,72,942 of population in 2011 censuses. Such type of study represents real situation of crop concentration and diversification in Gadchiroli District and helps to planners, agricultural scientists and research scholars.*

**Keywords:** Crop concentration, Diversification

**Introduction :**

Agriculture plays an important role in economic development. Agriculture still forms the backbone of Indian economy, inspite concerned efforts towards industrialization in last three decades. Agriculture contributes a high share of net domestic product by sectors in India. Farmers are growing numerous of crops in the field rather than single crop. Crop concentration and crop diversification are the two fundamental elements of agricultural geography because these two indices help to know cropping pattern of a region in a very detail way. Consequently, knowledge about concentration and diversification in a region may be considered very useful in proper agricultural land use planning. Crop concentration refers to the spatial density of individual crop or it may be stated as the variation in the density of any crop in a region at a fixed time span. On the other hand, crop diversification means cultivation of various crops from the soil. Thus, it refers to growing of varieties of crops either in a region or in the same agricultural field. Basically, during the period of the green revolution in the late sixties, there was a surge for diversified agricultural system to rejuvenate agricultural economy and for that purpose, it became necessary to diversify cropping pattern to country's growing demand and to increase

income by earning foreign exchange. Therefore, crop concentration and diversification do not only provide the idea of a region dominated by particular crop but also play a role of guide to strengthen agricultural economy and land use planning.

**Study Area :**

Gadchiroli District is located on the North-Eastern side of the State of Maharashtra. It is situated between 18.43` to 21.50' North latitude and 79.45' to 80.53' East longitude and this essentially indicates the Gadchiroli District is located in the Deccan Plateau. The district is surrounded on West, South and East by the Wainganga, Godawari and Indrawati rivers respectively. **Gadchiroli** district receives rainfall from South- Western winds mainly in the months of June, July, August and September. The average rainfall 1191.6 mm. in year 2011. Geologically the district contains almost all geological formations except Deccan Trap. Iron ore, base metals, barrettes, limestone, corundum, talc are some of the important economic minerals occurring in the district. The district can be divided into six geomorphic units of structural, denudational and fluvial origin. The Wainganga and Godawari have developed extensive alluvial deposits along their courses. The older alluvial plain is a flat surface of large aerial extent gently sloping towards these rivers and representing an earlier cycle of deposition. The unconsolidated material in this unit consists of sand silt and kankar with thickness as high as 30 m. The younger alluvial unit represents a later cycle of deposition. (Fig. 1)

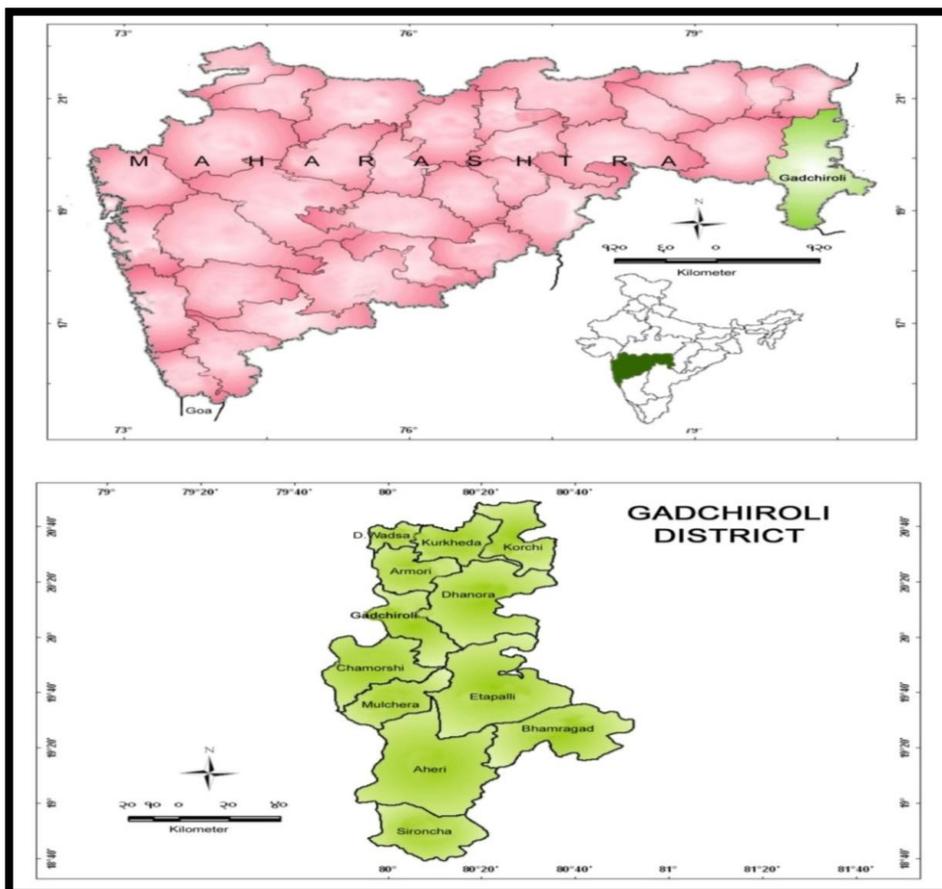
**Objectives:**

- The major object of this paper is to assess the crop concentration and diversification in Gadchiroli District of Maharashtra.

**Database and Methodology:**

Present study mostly relies on the secondary data collected through Agriculture Department and District statistical department of Gadchiroli and socio-economic abstract of Gadchiroli District. For the present investigation, District is selected as in general and tahsils in particular. The crop concentration has been calculated first in the study using Bhatia's method and in order to measure the crop diversification, Jasbir Singh's formula has been used. Here, it should be mentioned that higher index values represent high concentration and vice versa. On the other hand, if value of diversification comes close to 1, the diversification will be higher. In order to assess the crop combination, the following formula has been adopted.

**Location Map of Gadchiroli District**



**Crop Concentration** :Crop concentration means areal density of individual crop or crop concentration reveals the variation in the density of any crop in a given region at a point of time (Chouhan, 1987). The geographers pioneer work of Florence (1948), Chisholm (1962), Bhatia (1965), Jasbir Singh (1976) these are the contributors to mark the agricultural region with the help of the quotient method. It is remarkably influenced by the nature of terrain, rainfall and soil characteristics. In the study of cropping pattern, it is essential to know the areas where different crops dominate. This helps to take decision in future agricultural planning. For this purpose, a comparison of the relative strength of various crops is made by ranking them (Bhatia, 1965). In terms of types of concentration, crops may be identified by a single or multiple nuclei of concentration and to more widespread low density distribution (Singh and Dhillon, 2004). Thus demarcation of crop concentration region helps in ascertaining the areas where a particular crop grows well even with the help of minimum inputs, and thus great role for agricultural development and planning. The following formula has been used to delineate crop concentration areas of the study area-

$$\text{Crop Concentration Index} = \frac{\text{Area of particular crop in the unit}}{\text{Total cropped area in the unit area}} \div \frac{\text{Area of particular crop in the region}}{\text{Total cropped area in the region}}$$

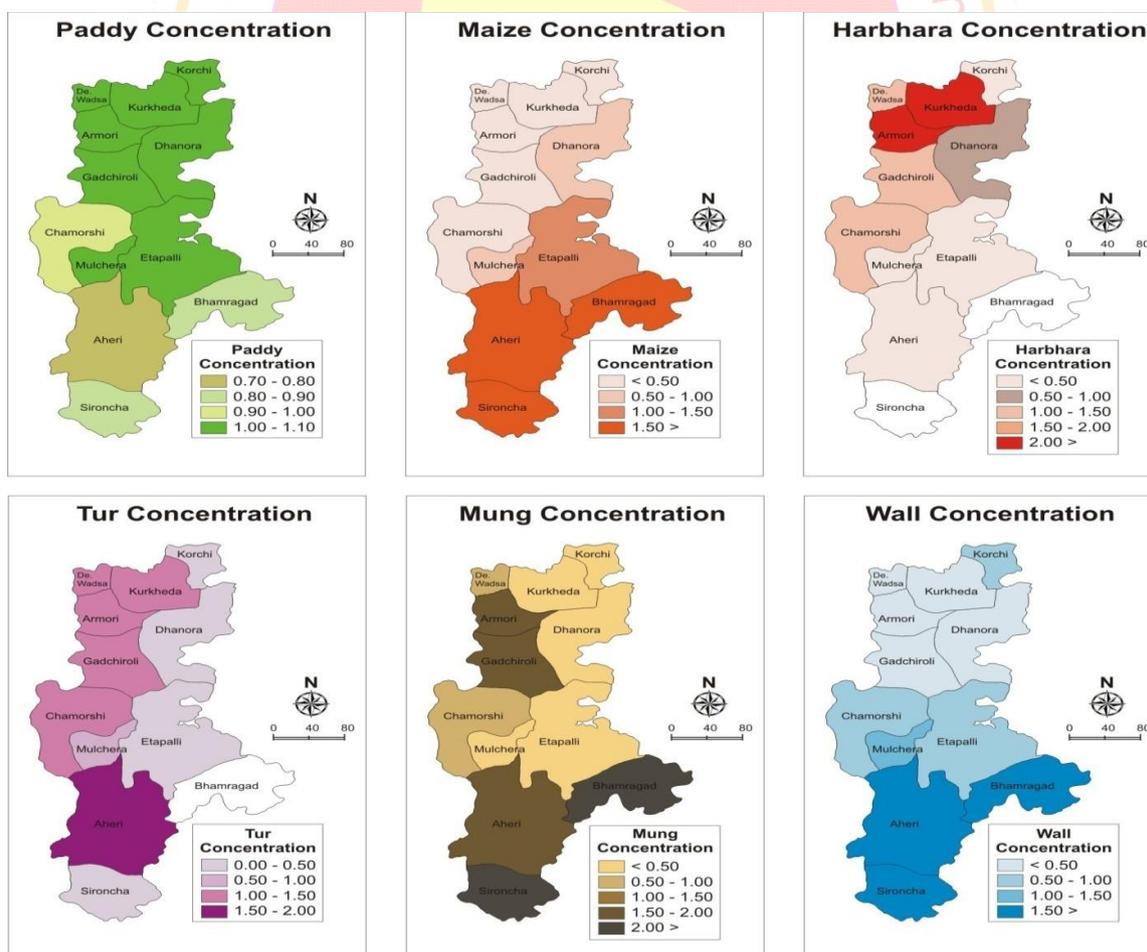
Here, the high index values represent high concentration and low values show lower level of concentration. Using the mentioned method, the crop concentration indices for all blocks have been calculated for major crops like paddy, Jawar, Mung, Maize, Harbhara, tur, wall etc.

**Table 1 : Crop Concentration in Gadchiroli District : 2015-16**

Sr.	Talukas	Paddy	Jawar	Maize	Harbhara	Tur	Mung	Wall	Soyabeen
1	Desaiganj	1.06	0.00	0.02	1.05	1.45	0.65	0.05	0.01
2	Armori	1.02	0.00	0.03	2.44	1.47	1.63	0.06	0.17
3	Kurkheda	1.05	0.00	0.03	2.03	1.16	0.45	0.04	0.00
4	Korchi	1.10	0.00	0.34	0.13	0.01	0.18	0.68	0.00
5	Dhanora	1.08	0.00	0.54	0.69	0.48	0.38	0.16	0.00
6	Gadchiroli	1.04	0.00	0.02	1.34	1.25	1.51	0.48	0.31
7	Chamorshi	0.94	0.00	0.23	1.19	1.34	0.91	0.64	2.84
8	Mulchera	1.03	0.50	0.82	0.42	0.77	0.32	1.42	0.91
9	Etapalli	1.09	0.00	1.08	0.02	0.01	0.43	0.62	0.00
10	Bhamragad	0.87	0.00	16.48	0.00	0.00	2.72	5.38	0.00
11	Aheri	0.76	7.55	3.35	0.16	1.81	1.45	4.71	4.17
12	Sironcha	0.91	6.10	6.41	0.00	0.28	2.51	3.92	0.10

Source : Compiled by author

Table 1 shows that the paddy is the leading crop of the district and paddy cultivation is highly concentrated in all the blocks district. Paddy concentration is mostly found in blocks like Korchi, Desaiganj, Dhanora, Kurkheda, Mulchera, Etapalli and all blocks of the district. Lowest concentrate in Aheri block area. Mung is the second important crop of the district although if compared with paddy concentration is too low. Highest concentration of mung cultivation is found in Bhamragad block then followed by Sironcha, Armori, Gadchiroli, and Aheri have moderate Mung concentration. Comparatively lower concentration is found in Korchi and Mulcheral. Tur is another important crop of the district and its concentration is confined into Aheri, Armori, Desaiganj, Chamorshi, Gadchiroli and Kurkheda block respectively. Comparatively lowest concentration is Korchi and Etapalli.



The next important crop of the district is Wall. It is confined into Bhamragad, Aheri, Sironcha and Mulchera is highly concentrated. The lowest concentrate is Kurkheda, Desaiganj, Armori block. Harbhara is highly concentrate in Armori, Kurkheda, Gadchiroli, Chamorshi and Desaiganj blocks. The lowest concentrate in Etapalli, Korchi blocks. Jawar is only highly concentrated in Aheri and Sironcha block. Maize is highly concentrated in Bhamragad block then Sironcha and Aheri block. Then similarly remaining all blocks is low concentrate of maize. Soyabeen is the highly concentrate in Aheri and Chamorshi block and lowest concentrate in with respectively Mulchera, Gadchiroli and Armori block.

**Crop Diversification :**The level of crop diversification largely depends on the geo-climatic or socio-economic conditions and technological development in a study region. Bhatia (1965) has evolved a simple formula taking into account the cropped area; to make objective measurement of crop diversification (1962) is a useful alternative index for measuring the extent of diversification in cropping pattern in an area. Jasbir Singh (1976) modified Bhatia's formula for the investigation of spatial pattern of crop diversification in Hariyana. Jasbir Singh's (1976) formula applying to work out crop diversification for the study region is given as:

$$\text{Index of Crop Diversification} = \frac{\% \text{ of total Cropped area under 'n' crops}}{\text{Number of 'n' crops}}$$

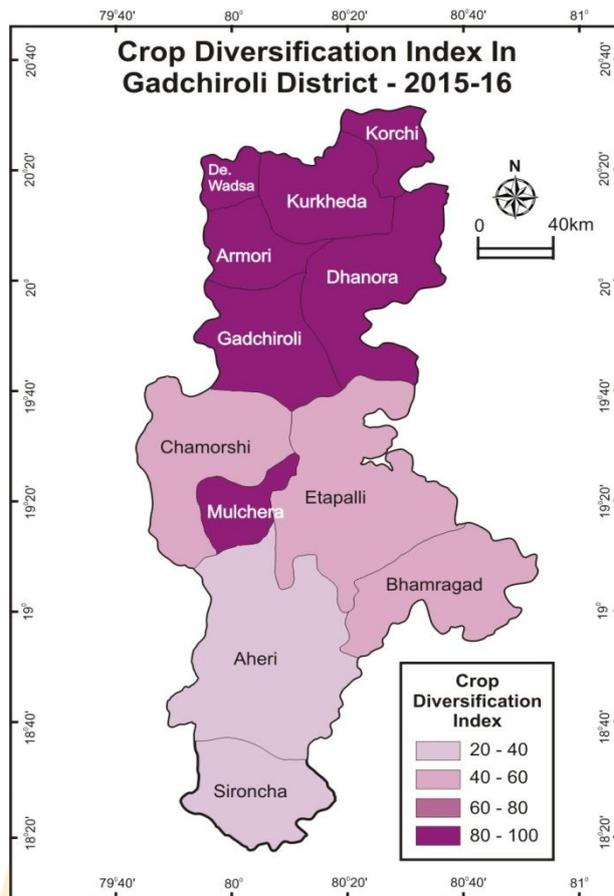
(Where 'n' indicates the crops which are individually occupy 5 percent or more of the total cropped area.)

**Table 2 : Crop Diversification in Gadchiroli District : 2015-16**

Sr.	Talukas	Paddy	Jawari	Maka	Soyabeen	Total Percentage	Total Crops	Crop Diversification Index
1	Desaiganj	95.88				95.88	1	95.88
2	Armori	92.44				92.44	1	92.44
3	Kurkheda	95.32				95.32	1	95.32
4	Korchi	99.13				99.13	1	99.13
5	Dhanora	97.44				97.44	1	97.44
6	Gadchiroli	93.70				93.70	1	93.70
7	Chamorchi	85.40			9.89	85.40	2	42.70
8	Mulchera	93.25				93.25	1	93.25
9	Etapalli	98.22				98.22	2	49.11
10	Bhamragad	78.61		17.38		95.99	2	48.00
11	Aheri	68.82	7.97		14.53	91.32	3	30.44
12	Sironcha	82.55	6.44	6.76		95.75	3	31.92

Source : Compiled by author

Based on index values, the blocks have been grouped into high, medium and low diversification levels. Table 2 shows that the Areas of high diversification were observed in Aheri, Sironcha blocks were in 3 crops. Medium diversification were observed in Bhamragad, Etapalli and Chamorshi tahsils cropped 2 crops. Whereas area of low diversification were found in Desaiganj, Armori, Kurkheda, Korchi, Dhanora, Gadchiroli and Mulcheratahsils are cropped only 1 crop.



**Conclusion:**

The cropping pattern of Gadchiroli district is paddy oriented as rice is the main staple food of the district. High concentration of paddy is found in all the blocks of the district. Although a number of crops like paddy, Jawar, Mung, Maize, Harbhara, tur, wall, etc are cultivated in the district but the area bears the tradition of cultivation of paddy throughout the year. However, there is spatial variation in the degree of crop concentration which is the result of varied physiographic, hydrological, pedological and socio-economic factors.

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