The Study Of Crop Combination In Deola Tahsil

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Abstract:-

Land is the basic resource of human society. Its utilization shows a reciprocal relationship between ecological conditions of a region and man. The varied nature namely, Soil, water, climate provides different area with variety of possibilities of development .It is therefore, necessary to evaluate the agricultural land use of the study region, needs to unfold the nature of ecology of the DeolaTahsil .Crop combination increases its fertility. And importantly, crop combination offers the highest returns in farming. A number of statistical techniques have been introduced by geographers, agriculturists, and economists to demarcate crop combination regions.

Key-word:-Crop-Combination,Crop-Pattern,Agriculture Land Use Pattern.

Introduction:-

Recently the crop combination analysis in geographical studies has gained momentum and its importance is increasing day by day. Any study of crops on regional scale must take into consideration the combinational analysis and the relative position of crops. Such analysis would ultimately minimize the change of oversimplified generalization (Ali, 1978). Combination studies are fruitful in many ways; firstly, they provide an adequate understanding of individual crop geography. Secondly, combination is in itself integrative realities that demand definition and distribution analysis, and lastly crop combination regions are essential for the construction of still more complex structure of vivid agricultural region (Weaver, 1954).

Combination Technique:-

A number of statistical techniques have been introduced by geographers, agriculturists, and economists to demarcate crop combination regions. The introduction of these crop combination methods by Weaver (1954), Thomas (1963), Coppack (1964), Johnson (1958), Rafiullah (1956), Bhatia (1960), Athawale (1966), Ayyar (1909) and Doi (1959). In the present study Weaver's technique (1954) used for finding crop combination.

Weaver's Crop Combination Method:-

In the field of agricultural geography Weaver was the first Geographer who used (1954) statistical technique to show the crop combination of the Middle West (USA). In his attempt for the delineation of agricultural regions of the Middle West in the United States, Weaver based his analysis on acreage statistics. Weaver computed the percentage of total harvested cropland occupied by each crop that held as much as one percent of the total cultivated land in each of the 1081 counties covered his work. Excluding a few counties like Houston and Minnesota in which the crop combination was easy to ascertain, other counties showed a complex and confused picture of the percentage, occupied by different crops. It was therefore necessary to device "a rigorous approach that would provide objective constant and precisely repeatable procedure and would yield comparable results for different years and localities". In his work Weaver calculated deviation of the real percentage of crops (occupying one percent of the cropped area) for all the possible combinations in the component areal units against a theoretical standard.

❖ **Formula :-**

$[\ \theta = \sum d^2 / n\ ]$

Where,

θ = Value of the crop- combination

d = the difference between the actual crop percentage in a given unit and appropriate percentage in the theoretical curve .

n = is the number of crops in a given combination .

The theoretical curve for the standard measurement was employed as follows:-

1	**1- crop combination**	**100%**	**Total harvested crop land in one crop**
2	2- crop combination	50%	In each of the two crops
3	3- crop combination	33.3%	In each of the three crops
4	4- crop combination	25%	In each of the four crops
5	5- crop combination	20%	In each of the five crops
6	6- crop combination	16.67%	In each of the six crops
7	7- crop combination	14.29%	In each of the seven crops
8	8- crop combination	12.50%	In each of the eight crops

For the determination of the minimum deviation the standard deviation method was used:-

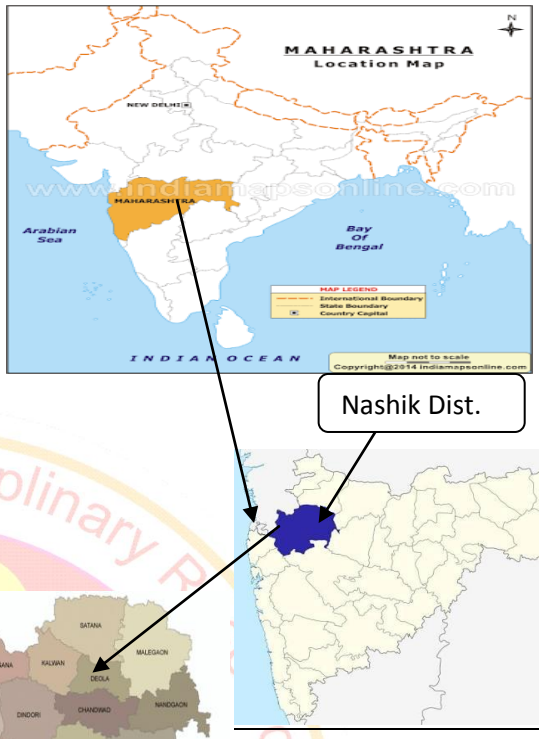
SD = ÕΣ d2/n

where is the difference between the actual crop percentages in a given county (areal unit) and the appropriate percentage in the theoretical curve and n is the number of crops in a given combination. As Weaver pointed out, the relative, not absolute value being significant, square roots were not extracted so, the actual formula used as follows:

d = Σ d2/n

Geographical Location Of Deola Tahsil:-

Nashik District is largest is largest District of Maharashtra state and town Deola is the tahsil of Nashik district located at coordinates between 20°29'31" North latitude and 74°13'52" East longitude. It is located on the height of 455 meters. It is plateau region of Maharashtra.



Objective :

The study is primarily concerned with the changing agricultural land use pattern in DeolaTahsil. To specific objectives of the present study are as follows :-

- To the study of agriculture crop in DeolaTahsil.
- To the study of crop pattern inDeolaTahsil.
- To the study of crop combination in DeolaTahsil.

Data & Methodology :-

- The present study is based on primary and secondary data.
- Primary data is collected from the field work and interviews of PanchaytSummiti of Deola.
- The secondary data is obtained from the sources Agriculture Department employments, Tahsil Office employments from the study region, Wikipedia, Google, www.mahaagri.com, library books etc.
- The collected data was processed, edited and analyzed by applying different statistical method , tables and diagrams.
- The methodology used is Crop Combinition Techniques by J.S. Weaver's method.

Process:-

"Crop Combination Techniques By J. S. Weaver's Method. "

Year 2013-2014 Crops Area in Hectors

Sr.No.	Crops	Area in Hectors	Area(%) Highest to Lowest
1	**Bajara**	**9212.00**	51%
2	Jawar	170.30	32.61%
3	Maize	14407.00	4.46%
4	Mung	771.40	2.73%
5	Groundnut	660.90	2.34%
6	Onion	1261.00	1.11%
7	Tur	314.00	0.60%
8	Other	1452.5	5.15%

Equation : - $[\theta = \sum d^2/n]$

1) **One Crop Combination : (Maize)**
   = $(100 – 51)^2 / 1$
   = $(49)^2 / 1$
   = 2401
2) **Two Crop Combination : (Maize + Bajara)**
   = $(50 – 51)^2 + (50 – 32.61)^2 /2$
   = $(-1)^2 + (17. 39)^2 /2$
   = 302.14 / 2
   = 151.20
3) **Three Crop Combination : (Maize + Bajara + Onion)**
   = $(33.33 - 51)^2 + (33.33 - 32.61)^2 + (33.33 - 4.46)^2 / 3$
   = $(-17)^2 + (0.72)^2 + (28.87)^2 / 3$
   = 312.22 + o.57 + 833.47 / 3
   = 1146.2 /3
   = 382.06

Result :- The since the variances two crop combination 151.20 its smallest that is result destined two crop combination = M + B.

Year 2014 – 2015 Crops Area in Hector

Sr. No.	Crops	Area in Hectors	Crop(%) Highest to Lowest
1	Bajara	8622.50	45.10%
2	Maize	12183.00	31.92%
3	Mung	794.50	6%
4	Groundnut	1323.50	4.90%
5	Onion	1621	2.94%
6	Tur	424	1.93%
7	Soybean	520	1.57%
8	Other	1521.5	5.64%
	Total	27010.50	

Equation : - $[\theta = \sum d^2/n]$

1) **One Crop Combination : (Maize)**
   = $(100 - 45.10)^2 / 1$
   = $(54.9)^2 / 1$ = 3014.
2) **Two Crop Combination : (Maize + Bajara)**
   = $(50 -45.10)^2 + (50 – 31.92)^2 / 2$
   = $(4.9)^2 + (18.08)^2 / 2$
   = 24.01 + 326.88 / 2
   = 350.89 / 2
   = 175.44
3) **ThreeCrop Combination : (Maize + Bajara + Onion)**
   = $(33.33 - 45.10)^2 + (33.33 - 31.92)^2 + (33.33 - 6)^2 /3$
   = $(-11.77)^2 + (1.42)^2 + (27.33)^2 / 3$
   = 138.53 + 1.99 + 27.33 / 3
   = 887.45 / 3
   = 295.82

Result: The since the variances two crop combination 175.44 its smallest that is result destined two crop combination = M + B.

Year 2015 – 2016 Crops Area in Hector

Sr. No.	Crops	Area in Hector	Crop(%)Highest to Lowest
1	Bajara	8096.00	39.33%
2	Maize	12168.00	26.30%
3	Mung	1179.00	7.47%
4	Groundnut	1299.00	4.22%
5	Onion	2300.00	3.83%
6	Tur	378.00	1.29%
7	Hourse Gram	396.00	1.23%
8	Other	5027.5	16.33%
	Total	30783.50	

Equation :- $[\theta = \sum d^2/n]$

1) **One Crop Combination : (Maize)**
   = $(100 - 39.33)^2 / 1$
   = $(60.67)^2 / 1$
   = 3680.85
2) **Two Crop Combination : (Maize + Bajara)**
   = $(50 – 39.33)^2 + (50 - 26.30)^2 / 2$
   = $(10.67)^2 + (23.7)^2 / 2$
   = 113.85 + 561.69 / 2
   = 375.54 / 2
   = 187.77

3) Three Crop Combination:
(Maize + Bajara + Onion)

$= (33.33-39.33)^2+(33.33-26.30)^2+(33.33-7.47)^2 / 3$
$= (-6)^2 + (7.03)^2 + (25.86)^2 / 3$
$= 36 + 49.70 + 668.74 / 3$
$= 754.44 / 3$
$= 251.48$

Result:-
The since the variances two crop combination 187.77 its smallest that is result destined two crop combination = M + B.

Year 2016 -2017 Crops Area in Hector

Sr.No.	Crops	Crops Area in Hector	Crop(%) Highest to Lowest
1	Bajara	9693.00	46.50%
2	Maize	13919.50	32.38%
3	Mung	903.50	3.03%
4	Groundnut	908.50	3.02%
5	Onion	732.50	2.45%
6	Tur	474.50	1.58%
7	Urad	82.00	0.27%
8	Other	3291.1	10.17
	Total	29934.60	

Equation :- $[\theta = \sum d^2/n]$

1) <u>One Crop Combination :</u>(Maize)
$= (100 - 46.50)^2 / 1$
$= (57.5)^2 / 1$
$= 2862.25$

2) Two Crop Combination :
(Maize +Bajara+Onion)
$= (50 - 46.50)^2 + (50 - 32.38)^2 / 2$
$=(3.5)^2 + (17.62)^2 / 2$
$= 12.25 + 310.46 / 2$
$= 32.71 / 2 \quad = 161.35$

3) Three Crop Combination :
(Maize + Bajara + Groundnut)

$= (33.33 - 46.50)^2+(33.33 – 32.38)^2 + (33.33 – 3.02)^2 / 3$
$= (-13.17)^2+(0.95)^2 + (30.03)^2 / 3$
$= 173.45 + 0.9095 + 918.09 / 3$
$= 1092.45 / 3$
$= 364.15$

Result:- The since the variances two crop combination 161.35 its smallest that is result destined two crop combination = M + B.

Result & Discussion:-

Total geographical area of DeolaTahsil is 461.54sq.km. out of this near about 17% area occupied by forest, Beside 6% to 8% area is fallow land means non- agricultural & non- cultivable land . Remeaning geographical area of tahsil about 75% is the net sown area. Out of total geographical area of the tahsil have largest net sown area in 2013-2017 is Maize it's near about 50% and more than 50% and lowest is Tur it's near about 2%.

In the pulses, oilseeds group of crop combination Mug, Tur, Urad and others are mostly cultivated in low rainfall ares of the tahsil specifically in dry farming.

In the year of the 2013 to 2017 of the tahsil higher percent of cultivated crop is Maize &Bajara, Where the irrigation & rainfall is available.

Conclusion:-

- In the year of 2013 to 2017 two crop combination of Maize and Bajara it's continuously reduced than one crop and three crop combination , like as in the year of 2013 – 14 two crop combination is 151.20 , 2014 – 15 it is 175.44, 2015-16 it is 187.77 and in the year of 2016 – 17 is about 161.35.
- This conclusion obtain through the crop combination method by J.S Weaver.
- The level of agricultural development is not uniform in the study region.
- DeolaTahsil of the study area come under medium agricultural development.
- Common problems observed during the field visit are scarcity of water for irrigation, availability of discontinue power supply, poor Transportation, poor quantity of fertilizers and capital.

Reference :-

1. "Statistical Analysis of Geographical Data" – Dr. ShrikantKarlekar (Daimond Publication , pune)
2. Statistical Geography - Ebdon David (1989)
3. Statistical Geography - King , (1989)
4. Statistical Method For Geography- Rogerson P.A.(SAGE pub.London, New Delhi)
5. www.mahaari.com
6. PanchyatSummtiOf Deola.
7. Tahsil Office Of Deola .
8. Agriculture Department OfDeola.