Case study

GEOGRAPHICAL ANALYSIS OF CROP CONCENTRATION AND CROP DIVERSIFICATION OF DHULE DISTRICT (MAHARASHTRA)

Abstract-

The study of crop concentration and crop diversification is important factor of agriculture region of any region or any state. The variations in the density of any crop in a region at a given point of time its known as crop concentration. The crop concentration of an area largely depends on its topography, climate, soil and local conditions. Each crop required a maximum, minimum and optimum temperature.[1] It has a tendency to have high concentration in the areas of ideal agro-climatic conditions and the density declines as the geographical conditions become less conducive. It is because of the suitability of agro-climatic conditions that cotton has high concentration in the black earth region, Wheat dominates in Punjab and Haryana, Bajara in Rajasthan, Sugarcane in Maharashtra and Utter Pradesh, Tea in Assam, and Rice is the leading crop in West Bengal, Orissa, coastal Andhra Pradesh, Tamil Nadu and Kerala, Jute in West Bengal. Delineation of crop concentration region helps in ascertaining the areas where a particular crop grows well even with the help of minimum inputs, and thus has great significance for agricultural development and planning.[2] crop Diversification means a variety of crops involving intensity of composition amongst field crops for agriculture land. The crop diversification in structural forms of agriculture such as cropping pattern, livestock, structure or agricultural enterprises.

Dhule district is important agriculture district in Maharashtra. Cotton, Bajara, Maize, Gram, Sugarcane, Jawar, Onion, has major crop in Dhule district. The cropping pattern, crop concentration, crop diversification is play on role for agriculture planning and development. Present paper attempt to geographical analysis to crop concentration and crop diversification Dhule district in period of 2020-21.

(Keywords- Crop, Agriculture, Crop Concentration, Crop Diversification, Percentage of Cropped Area)

Introduction-

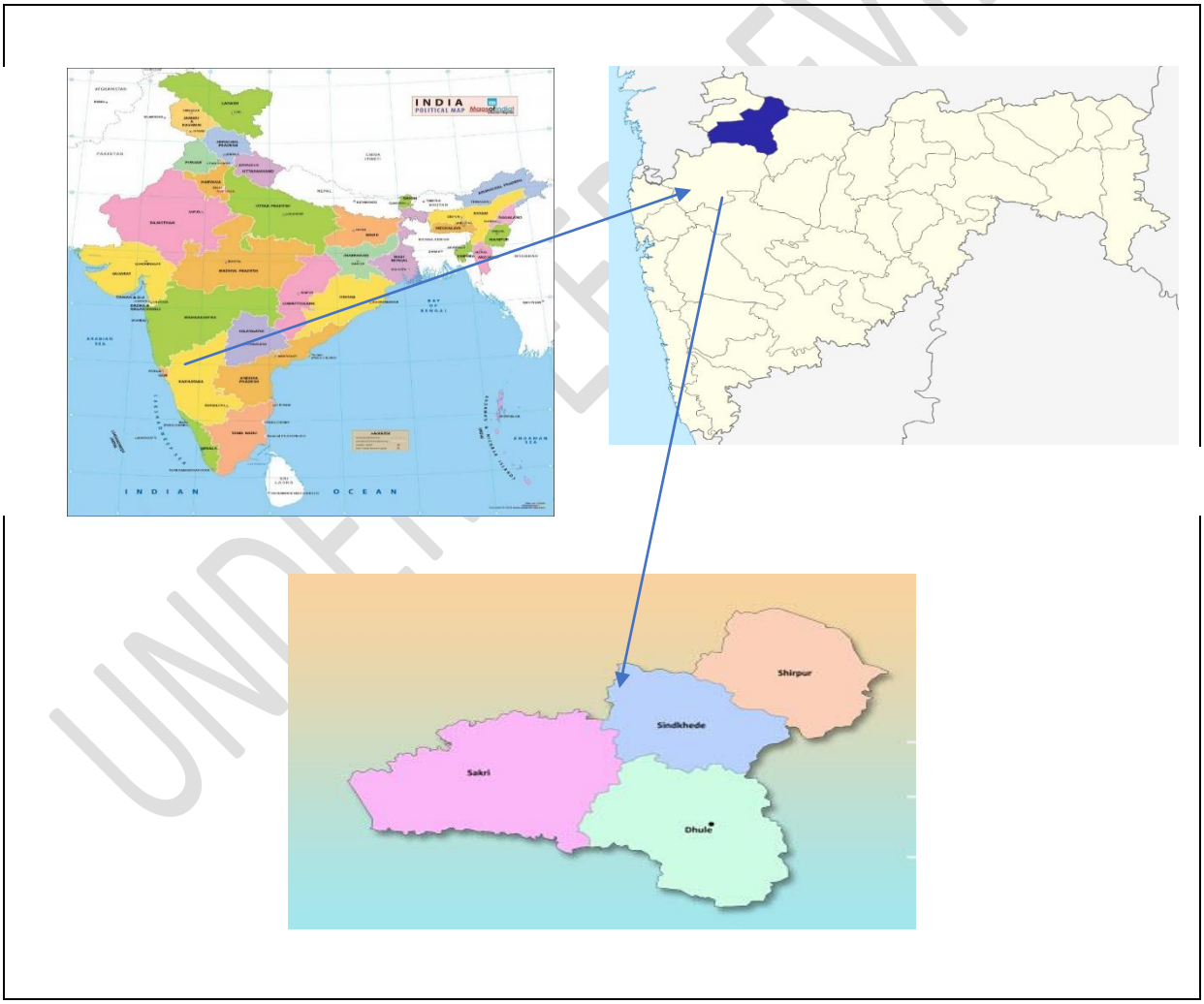
The meaning of crop concentration is spatial and temporal variations in the density of any crop in a region. The main objective of the study of crop concentration is to differentiate the area of high and low density of individual crop in a different part of study region. Each and every crop demands particular geographical condition. It has a tendency to have high concentrations in the areas of ideal agro- climatic conditions and the density declines as the geographical conditions become less conductive. The concept of Crop diversification is a opposite to crops concentration. Crop diversification means growing of a variety of crops in particular region. The greater number of crops led to greater competition, the higher is the magnitude of diversification. The study of crop concentration and crop diversification has great significance from the agricultural development and planning point of view. The study if

crop concentration and crop diversification play on important role for agriculture development and future planning.

Study area-

Dhule district, has important district in Maharashtra. The Dhule district located between 20^0 38' to 21^0 39" North latitude and $73^050^{"}$ to 75^0 13" East longitude. It covers a geographical area of 7195 Sq. Km and population of 20,50,862 as per the 2011 census. The density of population is 254 persons per sq. km. There are 04 tahsil were included in the Dhule district. Satpura ranges presented to the north of the study area. Because of the 'Satpura' ranges Dhule district is separated from Madhya Pradesh state, while 'Satmala' ranges separate the district from western Maharashtra the Dhule district is surrounded by Jalgaon district in the east, Madhya Pradesh state in north, Nashik district in the South, Nandurbar district and Gujarat State on the West. The climate of the district is generally dry expect during the monsoon season the average annual rainfall of the district as a whole is 544 mm.

Fig1 Map showing study location



Objective-

1) To analysis the area under the various crop in study region
2) To analysis the crop concentration in study region.

3) To study crop diversification in study region.

Data source and Methodology-

This study is based on secondary data. The present study required statistical information is obtained from census handbook the record of the local bodies' statistical department Government of Maharashtra, meteorological department as well as socio-economic abstract of Dhule district in 2020-21. The collected data was processed edited and analyzed by applying different statistical method and it's presented though tables maps.

For calculating crop concentration by use Bhatia method for location quotient may be expressed as under:

$$Crop\ concentration\ of\ crop\ a = \frac{Area\ of\ crop\ a\ in the\ component\ areal\ unit}{Area\ of\ all\ crop\ in\ the\ component\ areal\ unit} \Big/ \frac{Area\ of\ crop\ a\ in the\ entire\ region}{Area\ of\ all\ crop\ in\ the\ entire\ region}$$

The crop concentration is grouped under four heads:

1) Very High Concentration (Above 2%)

2) High Concentration (1% to 2%)

3) Moderate Concentration (0.75% to 1%)

4) Low Concentrations (Below 0.75%)

For calculating crop diversification by uses of Jasbir Singh's (1976) formula is used as given below:

$$\text{Index of Crop diversification} = \frac{Percentage\ of\ total\ cropped\ area\ in\ N\ crop}{Number\ of\ N\ Crop}$$

Where 'n' crops are those, which individually occupy 5% or more of the total cropped area in tahsil

Result and discussion –

Crop concentration-

Crop concentration means that area under different crops, livestock or agricultural enterprises when viewed together by superimposition reveal areas wherein their regional concentrations do not overlap.[3] Crop concentration means the variations in the density moderate level of any crop in a region at a given point of time.

a) **Wheat**:

Table no 2 indicates that, Shirpur (1.20), Sakri (1.20) and Shindhkheda (1.00) tahsil have recorded high degree crop concentration under Wheat crop. while moderate concentration (0.75% to 1%) was found in Dhule tahsil has 0.65.

b) Jowar:

Very High degree (above 2%) of Jowar concentration was found in Shirpur tahsil (2.15), while high degree (1 % to 2 %) of Jowar concentration was found in Dhule tahsil

(1.02).modrate crop concentration was found in Shindhkheda tahsil (0.92), and low concentration (below 0.75%) are recorded in sakri tahsil (0.02).

Table no 1 – Area under the crop

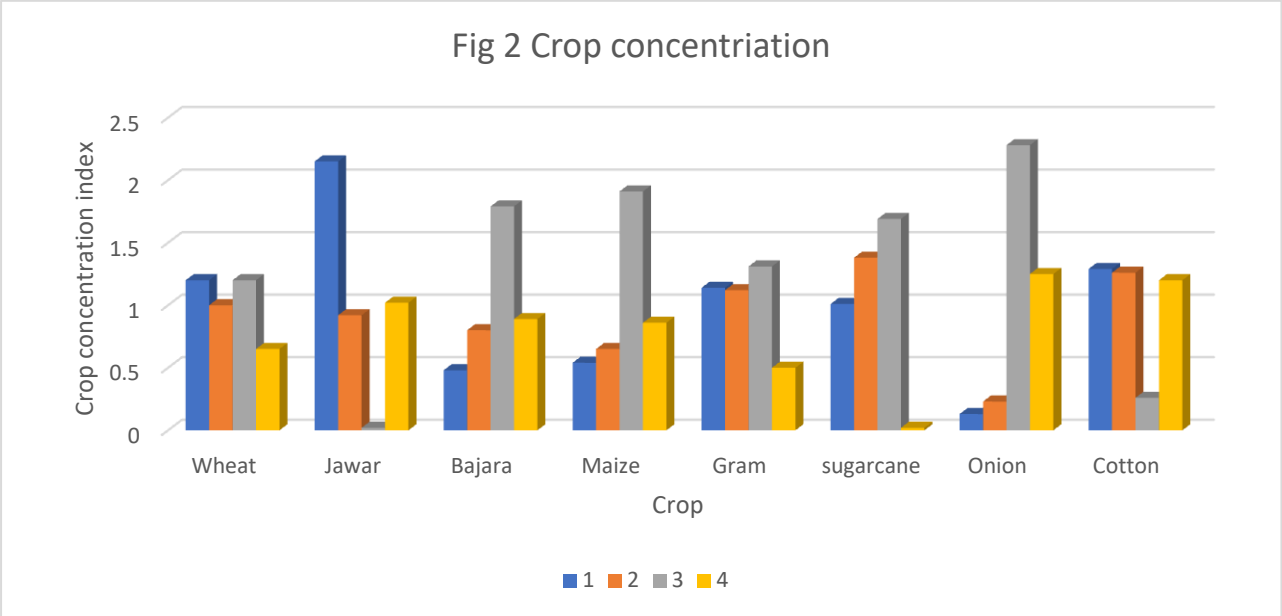
Sr.no	Tahsil	Area under the crop								Total
		Wheat	Jawar	Bajara	Maize	Gram	sugarcane	Onion	Cotton	
1	Shirpur	14700	5126	6062	8595	8650	630	1000	65582	110345
2	Shindhkheda	13505	2384	10970	11400	9236	943	2000	70107	120545
3	Sakri	16212	54	24767	33515	10996	1165	20000	14854	121563
4	Dhule	9661	2922	13567	16440	4575	13	12000	73914	133092
	Total	54078	10486	55366	69950	33457	2751	35000	224457	485545

Source- socio-economic abstract Dhule district 2020-21

Table no 2 -Crop concentration of study region

Sr.no	Tahsil	Crop concentration							
		Wheat	Jawar	Bajara	Maize	Gram	sugarcane	Onion	Cotton
1	Shirpur	1.20	2.15	0.48	0.54	1.14	1.01	0.13	1.29
2	Shindhkheda	1.00	0.92	0.80	0.65	1.12	1.38	0.23	1.26
3	Sakri	1.20	0.02	1.79	1.91	1.31	1.69	2.28	0.26
4	Dhule	0.65	1.02	0.89	0.86	0.50	0.02	1.25	1.20

Source: Compiled by the Researcher



c) Bajara:

High degree (1% to 2%) of Bajara crop concentration was found in Sakri tahsil (1.79), otherwise moderate degree (0.75 % to 1 %) of Bajara crop concentration was found in Dhule (0.89) and Shindhkheda (0.80) tahsil. While low concentration (below 0.75%) are recorded in Shirpur tahsil (0.48).

d) Maize:

The crop concentration of maize crop Sakri tahsil has recorded High concentration is 1.91. while moderate degree of Maize crop concentration was found in Dhule tahsil

(0.86). low crop concentration was found in Shindhkheda tahsil (0.65), and Shirpur tahsil (0.54).

e) Gram:

The crop concentration of gram crop Sakri (1.31), Shirpur (1.14) and Shindhkheda tahsil (1.12) has recorded High concentration. while low degree of crop concentration was found in Dhule tahsil (0.50).

f) Sugarcane:

High degree (1% to 2%) of sugarcane crop concentration was found in Sakri (1.69), Shindhkheda (1.38) and Shirpur tahsil (1.01), otherwise low degree (below 0.75 %) of sugarcane crop concentration was found in Dhule (0.02).

g) Onion:

The crop concentration of onion crop Sakri tahsil has recorded very High concentration is 2.28. while high degree of onion crop concentration was found in Dhule tahsil (1.25). low crop concentration was found in Shindhkheda tahsil (0.23), and Shirpur tahsil (0.13).

h) Cotton:

Cotton is important crop in study region the crop concentration of cotton crop Shirpur (1.29), Shindhkheda (1.29) and Sakri tahsil (1.20) has recorded High concentration. while low degree of cotton crop concentration was found in Sakri tahsil (0.26).

Crop diversification-

Crop diversification is a concept, which is opposite to crop concentration. crop diversification means a variety of crops involving intensity of composition amongst field crops for arable land. The diversification in structural forms of agriculture such as cropping pattern, structure or agricultural enterprises, explain why it is possible or necessary to raise a variety of these forms, which possess nearly or even proportion. Essentially, it is an indicator of multiplication of agricultural activities, which obviously involve intense competition among various activities for space.

Table no 3- Percentage area of cropped area

Sr.no	Tahsil	Percentage area of cropped area							
		Wheat	Jawar	Bajara	Maize	Gram	sugarcane	Onion	Cotton
1	Shirpur	13.32	4.64	5.49	7.79	7.83	0.57	0.91	59.52
2	Shindhkheda	11.20	1.97	9.10	9.45	7.66	0.78	1.65	58.15
3	Sakri	13.33	0.04	20.37	27.57	9.04	0.95	16.45	12.21
4	Dhule	7.25	2.19	10.19	12.35	3.43	0.009	9.01	55.53
	Total	11.13	2.15	11.40	14.40	6.89	0.56	7.20	46.22

Source: Compiled by the Researcher

Table no 4- Crop Diversification Index

Sr.no	Tahsil	No. of crop	% Area	Crop Diversification Index
1	Shirpur	05	93.95	18.79
2	Shindhkheda	05	95.56	19.11
3	Sakri	06	98.97	16.49
4	Dhule	05	94.33	18.86
	Total	06	97.24	19.44

Source: Compiled by the Researcher

Indices of crop diversification are calculated for the period i.e.,2020-21. Table No. 4 shows the indices of crop diversification, which are grouped into following four categories:

i) Areas of very high diversification (Below 14%)
ii) Areas of high diversification below (14% to 16%)
iii) Areas of moderate diversification (16% to 18%)
iv) Areas of low diversification (Above 18%)

The total crop diversification index of Dhule district is 19.44 its shows low diversification. Tahsil wise Areas of low crop diversification was found in Shindhkheda (19.11), Dhule (18.86) and Shirpur (18.79). while area of moderate crop diversification is observed in Sakri tahsil its 16.49.

Conclusion-

It is concluded from the above study that crop concentration of Shirpur tahsil has recorded very high concentration of Jawar crop while Wheat, Gram, Sugarcane and Cotton crop has recorded high crop concentration. In Shindhkheda tahsil has recorded high crop concentration in Wheat, Gram, Sugarcane and Onion crop. Another crop has recorded moderate and low crop concentration. Sakri tahsil has recorded very high crop concentration of Onion crop on the other hand Wheat, Bajara, Maize, and Sugarcane crop recorded high crop concentration and Jawar, Cotton crop has recorded low concentration.in Dhule tahsil has Jawar, Onion and Cotton crop are recorded high concentration. Other crop like Wheat, Bajara, Maize and gram has recorded moderate concentration. Thus Cotton, Gram, Wheat and Maize crop has recorded high or moderate crop concentration all tahsil of study region. Thus, eastern part of study region has highest concentration of cotton crop while western part has highest concentration of onion crop.

Crop diversification index of Dhule district is found low diversification. Shindhkheda, Dhule and Shirpur Tahsil has found low crop diversification. while in Sakri tahsil has found moderate crop diversification. Topography, climate, soil, market price and demand play important role on crop concentration and diversification in study region.

References-

1) Hussain, M (1979) – Agricultural Geography, inter-indie Delhi P-45
2) Singh, Jasbir and S.S. Dhillan (1989): "Agricultural Geography" Tata Mc Graw Hill Publishing Co. Ltd. Delhi. P-218.
3) Govt.of India Dhule district census handbook 2011
4) Chouhan, T.S. (1987): Agricultural Geography; A case study of Rajshthan State, Academic Publication, Jaipur. p.258.
5) Socio-economic abstract of the Dhule District 2020-21 P-78 to 80
6) Government of Maharashtra- Gazetteer of Dhule district
7) www.dhule.nic.in