



SPATIO-TEMPORAL CHANGES IN CROPPING PATTERN IN MARATHWADA REGION: A GEOGRAPHICAL ANALYSIS

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Abstract

The study of cropping pattern is important for the development of agriculture. Cropping pattern define as the proportion of area under different crops at a point of time, whereas change in cropping pattern refers to the change in area under different crops at two different points of time. The technique of crop diversification is the one of the essential tools to understand cropping pattern in present study. Main objective is to identify change in cropping pattern in Marathwada region during 1990-91 and 2009-10. In order to identify spatio-temporal changes in cropping pattern, Jasbir Singh's (1976) crop diversification method is applied.

District is taken as basic unit of investigation. Entire study is based on secondary data which is derived from socio-economic review and statistical abstracts of all districts of Marathwada region. Study reveals that Jalna, Osmanabad, Parbhani and Hingoli districts experienced high crop diversification during 1990-91 and 2009-10 while in Latur and Nanded no any change observed in cropping pattern during 1990-91 and 2009-10. In Parbhani district low crop diversification was observed during 1990-91 while dramatic change in cropping pattern was noticed in the one district with experienced high degree of crop diversification during 2009-10 may be developed irrigation facilities and Beed district in 2009-10 while no change in Aurangabad district.

Keywords: *Cropping pattern, Crop diversification, agriculture.*

Introduction:

Agriculture development is depends on crop diversification pattern. The study of crop diversification pattern provides a base for agricultural planning. Changing pattern of crop diversification is a reliable index to understand agriculture development in the study region. It will help in identifying weaker areas for agricultural planning.

Crop diversification Means rising of a variety of crops involving intensity of competition amongst field crops for arable or cultivable land. "Keener the competition, higher the magnitude of the crop diversification and lesser the competition the greater will the trend towards specialization of monoculture farming where emphasis is on one or two crops" (Jasbir Singh 1976). The diversification in agriculture is also practiced with a view to avoid risk and uncertainty due to climate change.

Objective:

The main objective of this paper is to identify spatio-temporal changes in cropping pattern by using crop diversification technique and demarcate different crop diversification regions.

The study region:

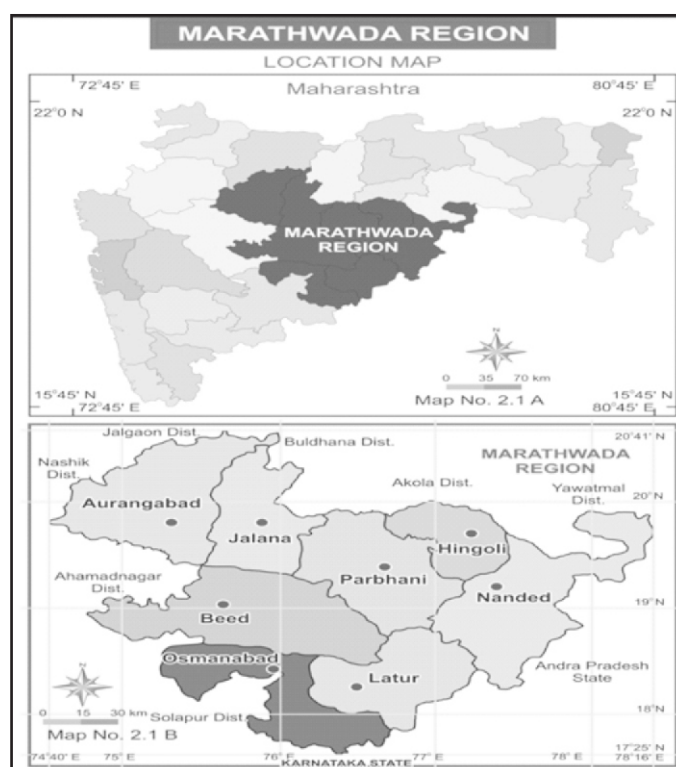
Marathwada is one of the five physiographic division of Maharashtra State. Aurangabad division almost completely coincide with the Marathwada region of Maharashtra. Marathwada region lies in south central part of Maharashtra state. Marathwada region extends from 17° 35' to 20° to 40' North latitude and 40° 40' to 78° 15' east longitudes, the region has a total land area of 64525 sq. kms (20.97 percent of the state) and a population of 15629248 (2001 census). The region is bounded by Jalgaon, Buldhana, Akola and Yawatmal district in the north by Naski and Ahmednagar district in the west by Solapur district in the south, by Bidar district of Karnataka is southwest and Medak/Nizamebad district of Andhra Pradesh in the east.

Marathwada is one of the administrative divisions of Maharashtra state with its head quarter at Aurangabad city. Marathwada region comprising of eight districts viz. Aurangabad, Beed, eight

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districts viz. Aurangabad, Beed, Hingoli, Jalna, Latur, Nanded, Osmanabad and parbhani. The region is divided into 46 talukas administrative purpose.

The entire region is situated at an average height of above 300-650 m. above mean sea level gradually sloping from West to East, and is traversed by hill ranges origination from the Sahyadris in the west and the Satpudas in the North. Different ranges derive their names from local sources, the northern being Ajanta satmala ranges and the southeren there are sources, the northern being AjanthaSatmalaregoins and the southren the Balghat ranges, In addition to these there are scatered hillocks of varying heights throughout the region thehighest peak, 'SurpalNath' (960m, above MSC) being situated near Kannad in Aurangabad district.



Data base and Methodology:

The present study is based on secondary data which is derived from socio-economic review and statistical abstracts of all districts of Marathwada region. Two time periods of 1990-90 and 2009-10 are taken for revealing the spatio-temporal pattern for crop diversification regions.

Bhatia (1965) adopted and introduced crop diversification technique in order to understand crop competition. Later on Jasbir singh modified this index and applied in Haryana (1976); Ayyer (1969) modified Bhatia's method of crop diversification with accounting for those crops which occupy at least one per cent of the gross cropped area.

In the present study to identify spatio-temporal changes in cropping pattern, Jasbir singh's method (1976) of crop diversification is applied. The crops having more than ten percentages have been

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considered for computing. This modified formula expresses as;

$$\text{Index of CD} = \frac{\% \text{ of total harvested area under 'x' crop}}{\text{Number of 'x' crop}}$$

Where,

'X' crops are those which individually occupy 10 percent or more area of the total harvested area. Statistical technique has been used for analysis. And district is taken as basic unit of investigation.

Discussions:

The variation in spatial pattern of indices is examined for year 1990-91 (Table -1) and 2009-10 (Table-2) for studying the variation in indices three classes are registered namely:

- i) Area high diversification below - 16
- ii) Area of medium diversification - 16-20
- iii) Area Low diversification above – 20 (Table 3).

Table - 1

Index of Crop Diversification in Marathwada Region (1990-91)

Sr. No.	Districts	Area under crops in %										CDI
		Rice	Jowar	Bajra	Wheat	Maiz	Cereal	Pulses	S.cane	Cotton	Oil seeds	
1	Aurangabad	2.54	14.07	40.97	17.41	38.46	18.41	15.25	24.13	8.57	10.10	22.25
2	Jalna	2.45	10.64	17.59	15.97	14.34	11.91	13.72	10.62	17.82	7.85	14
3	Beed	6.62	18.35	34.64	13.42	12.24	20.06	10.71	17.67	4.25	16.80	17.87
4	Latur	22.96	11.12	2.41	9.79	27.62	9.97	15.08	10.45	3.14	21.19	18
5	Osmanabad	13.25	13.89	2.30	10.99	2.45	11.93	13.89	17.16	0.00	23.46	14.85
6	Nanded	28.77	12.59	0.15	10.78	0.35	10.99	10.38	10.96	30.54	8.40	16.42
7	Parbhani	23.41	19.33	1.94	21.65	4.55	16.73	20.97	9.01	35.68	12.19	21.28
8	Hingoli	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
9	Div.	7.81	32.96	24.78	28.86	30.49	26.73	34.95	30.72	28.29	31.55	29.88

Source: compiled by researcher

Table No. 2
Index of Crop Diversification in Marathwada Region (2009-2010)

Sr. No.	Districts	Area under crops in %										CDI
		Rice	Jowar	Bajra	Wheat	Maiz	Cereal	Pulses	S.cane	Cotton	Oil seeds	
1	Aurangabad	0	11.84	38.06	17.11	55.26	20.10	9.95	7.36	20.47	2.31	27.16
2	Jalna	0	9.85	12.16	7.96	26.82	11.55	10.17	9.84	21.15	5.26	16.4
3	Beed	3.03	15.74	40.95	24.81	5.29	19.10	12.08	23.36	16.21	8.95	21.71
4	Latur	16.16	9.62	1.24	9.56	2.32	7.81	15.23	21.58	0.23	24.13	19.25
5	Osmanabad	30.81	22.87	5.47	14.30	8.17	18.15	15.67	20.66	0.31	13.48	19.42
6	Nanded	28.28	10.17	0.00	7.07	0.52	7.68	16.38	6.98	18.73	18.12	18.4
7	Parbhani	15.66	15.43	2.02	12.04	1.00	11.80	13.14	5.95	15.84	13.69	14
8	Hingoli	6.06	4.48	0.09	7.15	0.61	3.82	7.39	4.27	7.06	14.06	14.06
9	Div.	1.34	36.41	31.11	24.97	28.81	27.11	34.97	24.96	40.52	30.08	31

Source: compiled by researcher.

Table No. 3
Crop Diversification Pattern (1990-91 and 2009-10)

Sr. No.	Districts	Crop Diversification Index (CDI)	
		1990-91	2009-10
1	Aurangabad	22.25	27.16
2	Jalna	14	16.4
3	Beed	17.87	21.71
4	Latur	18	19.25
5	Osmanabad	14.85	19.42
6	Nanded	16.42	18.4
7	Parbhani	21.28	14
8	Hingoli	0	14.06
9	Div.	29.88	31

High Diversification Region:

Area with high diversification was observed in Osmanabad (14.85) and Jalna (14.00) district during 1990-91 while during 2009-10 Parbhani (14.00) and Hingoli (14.06) districts experienced high diversification of crops. It indicates that cropping patterns in Parbhani and Hingoli districts was changed.

Table No. 4
Change in Crop Diversification Pattern (1990-91 and 2009-10)

Sr. No.	Crop Diversification Class	CDI Value	Name of the Districts, 1990-91	Name of the Districts, 2009-10
1	High	< 16	Osmanabad, Jalna.	Parbhani, Hingoli.
2	Moderate	16-20	Beed, Latur. Nanded,	Jalna. Osmanabad, Latur, Nanded,
3	Low	> 20	Aurangabad, Parbhni	Aurangabad, Beed.

Source: compiled by researcher.

Medium Diversification Region:

It was found that Beed (17.87), Latur(18.00) and Nanded (16.42) had medium diversification of crops during 1990-91 whereas during 2009-10 it had again medium diversification of crop noticed in Latur(19.25) and Nanded (18.4).It means that there was no change in cropping pattern, but change was observed in Osmanabad (19.42) district in this category.

Low Diversification Region:

Low crop diversification was found in Aurangabad (22.25) and Parbhani (21.28) districts during 1990-91but in 2009-10 it was again found in Aurangabad (27.16) and Beed (21.71) districts. In only one district Parbhani noticed change from low to high degree of diversification.

Conclusion:

The technique of crop diversification is one of the essential tools to understand cropping pattern. Study reveals that Osmanabad, Jalna and Parbhani, Hingoli districts experienced high crop diversification during 1990-91 and 2009-10 respectively. This change due to geographical favorable condition.

In Aurangabad, Parbhani districts low crop diversification was found in 1990-91 and in 2009-10 it was again low crop diversification noticed in Aurangabad and Beed districts. Dramatic change in cropping pattern was noticed in Parbhani district experienced high degree of crop diversification may be due to the developed irrigation facilities and mechanization during 2009-10. In Osmanabad and Beed districts noticed change from high to medium and from medium to low degree of diversification respectively in 2009-10.

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