Research Paper

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

Umesh S.Mane[1] Raghav Sharma[2] Anil Yedage[3]
[1]Dalit Mitra Kadam Guruji College Mangalvedha, Solapur. Maharashtra, India
[2]Associate Professor, ARNI University,indora, Himachal Pradesh
[3]Assistant Professor, Parvatibai chowgule college Margao Goa

Abstract

Cropping pattern research is crucial to the advancement of agriculture. Cropping pattern change is the difference between the area under different crops at two distinct times and the proportion of different crops under different crops at a given period. Crop diversification is a crucial strategy for comprehending the cropping pattern in the current study. Finding changes in the cropping pattern in the Pune region between 1990–1991 and 2009–2010 is the primary goal. The crop diversification approach developed by Jasbir Singh (1976) is used to pinpoint spatiotemporal changes in cropping patterns. The district is used as the foundational unit of analysis. The entire analysis is based on secondary data that comes from statistical abstracts of each district in the Pune region as well as socio-economic reviews. According to the study, the districts of Pune, Satara, Sangali, Kolhapur, and Solapur saw significant crop diversification between 2000–01 and 2018–19, although the cropping patterns in Solapur and Sangali did not alter during those years. Kolhapur district saw low levels of crop diversification from 2018 to 2019, whereas Solapur district saw significant changes in cropping patterns from 2009 to 2010 and one district experienced high levels of crop diversification from 2018 to 2019. Sangali district saw no changes in cropping patterns during this time.

Keywords: Cropping pattern, Crop diversification, agriculture CDI

Introduction:

The pattern of crop diversification is essential to the development of agriculture. A foundation for agricultural planning is provided by the study of crop diversification patterns. Crop diversification patterns that are changing provide a good indicator of how agriculture is developing in the research area. It will assist in determining less effective regions for agricultural planning.

Diversity of crops denotes the emergence of a range of crops with intense field crop competition for arable or cultivable land. "The trend towards specialization of monoculture farming, where emphasis is on one or two crops, will be greater the less competition there is, the higher the magnitude of crop diversification, and the sharper the competition" (Jasbir Singh 1976). Agricultural diversification is also done to reduce risk and uncertainty brought on by climate change.

Review of literature:

Generally, crop diversification refers to the diversity among crops grown in a specific region. It's contrary to the conception of crop specialization which refers to change in the combination of crops cultivated in an agrarian region and measured by the proportion of area enthralled by colorful crops. (U.K.Bodosa,2014) Crop diversification also describes as the shift from single crop husbandry to multiple crops tilling or practice of adding number of crops with their kinds or from subsistence husbandry to marketable husbandry. Crop diversification is an agrarian system which largely depends on physical- environmental and socio- profitable factors besides agrarian, geographical, institutional and technological structure and composition of that region (Chakraborty A, 2012) If this system is rehearsed in applicable ways also it helps to induce employment, increase crop intensity, increase diversification of agrarian product, enhance ranch income thereby easing poverty. It also minimizes adverse effect of crop specialization or mono cropping system, avoid pitfalls and query of crop failure due to climatic and natural changes (Acharya S.P.,2011, Joshi P.K., 2004)

Objective:

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This paper's primary goal is to define distinct agricultural diversification regions and use crop diversification techniques to detect spatiotemporal changes in cropping patterns.

Study Area:

The state is split into six divisions for administrative suitability purposes. Pune division has been chosen for the current study among them 33 administrative units are chosen as the study area as a result. It covers the latitudes of 15^0 45' N to 19^0 24' N and the longitudes of 73^0 19' E to $76^0$15' E. The study area is roughly 357 km in length from north to south and 267 km from east to west. The study area comprises five districts with a total of 58 tahsils, covering an area of approximately 57,235 square kilometres.

Pune division has a unique geographic character. The western boundary of the region is marked by the Sahyadri crest line. The interstate border between the states of Goa and Karnataka forms the southern fringe. The districts of Nasik and Ahamadnagar define the northern region. The district boundary of Solapur divides the area from Marathwada. The Karnataka districts of Gulbarga are located to the east of the area. Put another way, the region is bordered by the states of Karnataka to the south, the Konkan region to the west, the Nasik district to the north, and the Aurangabad division to the northeast.

Figure No.1
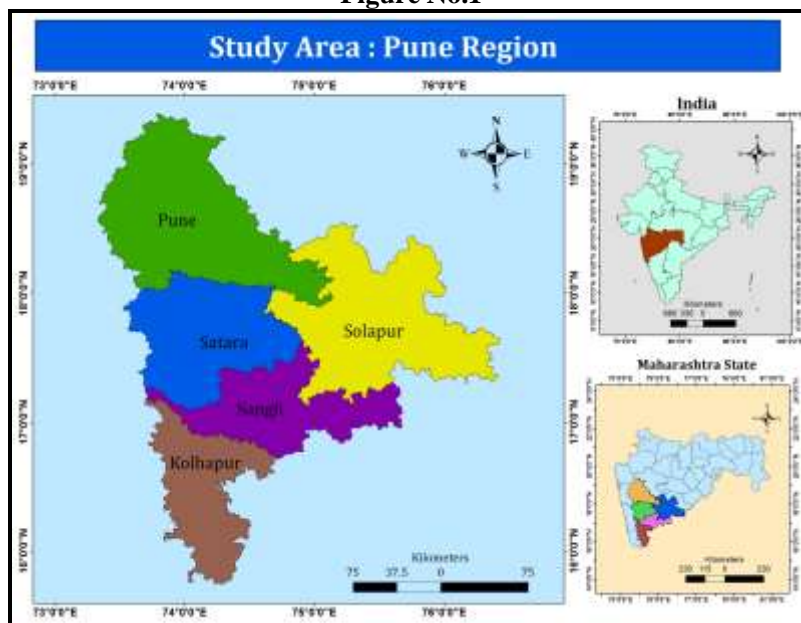
Data base and Methodology:

The secondary data used in this study comes from statistical abstracts and socio-economic reviews of every district in the Marathwada region. We use two time periods to show the spatiotemporal pattern for crop diversification regions: 2000–01 and 2018–19. To comprehend crop competition, Bhatia (1965) adopted and introduced the technique of crop diversification. Afterwards, Jasbir Singh changed this index and implemented it in Haryana (1976); Ayyer (1969) adjusted Bhatia's crop diversification strategy to include crops that account for at least 1% of the gross cropped area. The current study uses Jasbir Singh's (1976) method of crop diversification to identify spatiotemporal changes in cropping pattern.

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

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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.

The variation in spatial pattern of indices is examined for year 2000-01 and 2018-19 for studying the variation in indices three classes are registered namely:

1. Area High Diversification Below: - 12
2. Area of Medium Diversification: - 08-12
3. Area Low Diversification Above: - 08

Table No.1.1
Index of Crop Diversification in Marathwada Region (2000-01)

Sr. No	District	Area Under Crops in %									
		Rice	Jowar	Wheat	Bajra	Maiz	Cereal	Pulses	S.Cane	Oil Seeds	CDI
1	Pune	3.35	15.22	12.89	8.96	10.83	11.40	5.66	22.44	10.10	11.20
2	Satara	4.25	16.36	16.36	10.58	9.42	15.11	6.12	25.15	8.22	12.39
3	Sangli	1.26	10.25	12.78	18.44	7.52	6.32	10.25	21.28	7.55	10.62
4	Solapur	2.63	25.29	6.88	7.85	10.66	7.45	16.32	28.21	8.69	12.66
5	Kolhapur	4.56	6.36	14.52	17.52	12.5	6.2	17.55	27.56	9.22	12.88
	Division	3.45	12.05	10.82	16.98	11.56	3.87	21.37	28.91	8.36	13.06

(*Sources: -Agriculture Department of Maharashtra State, 2000-01, Compiled by researcher*)

Table No.1.2
Index of Crop Diversification in Marathwada Region (2018-19)

Sr. No	District	Area Under Crops in %									
		Rice	Jowar	Wheat	Bajra	Maiz	Cereal	Pulses	S.Cane	Oil Seeds	CDI
1	Pune	0	1.8	15.11	1.5	10.66	10.1	8.22	10.25	12.1	7.74
2	Satara	4.25	12.3	9.36	8.22	4.22	11.22	15.24	26.14	10.22	11.24
3	Sangli	1.2	10.27	10.78	12.64	12.81	11.52	10.22	10.22	12.55	10.24
4	Solapur	1.23	9.55	7.22	6.22	9.22	10.29	15.28	30.21	9.69	10.99
5	Kolhapur	1.25	15.21	12.1	15.36	3.44	11.42	10.22	18.56	10.22	10.86
	Division	1.586	9.826	10.914	8.788	8.07	10.91	11.836	19.076	10.956	10.21

(*Sources: -Agriculture Department of Maharashtra State, 2018-19, Compiled by researcher*)

Table No.1.3
Crop Diversification Pattern (2000-01 and 2018-19)

Sr. No	District	Crop Diversification Index (CDI)	
		2000-01	**2018-19**
1	Pune	11.20	7.74
2	Satara	12.39	11.24
3	Sangli	10.62	10.24
4	Solapur	12.66	10.99
5	Kolhapur	12.88	10.86
	Division	13.06	10.21

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(*Sources: -Compiled by researcher*)

Table No. 1.4
Change in Crop Diversification Pattern (2000-01 to 2018-19)

Sr. No .	Crop Diversification Class	CDI Value	Name of the District	
			2000-01	2018-19
1	High	> 12	Satara, Solapur and Kolhapur	Nil
2	Medium	08-12	Pune, and Sangali	Satara, Sangali and Kolhapur
3	Low	< 08	Nil	Pune

(*Sources: -Compiled by researcher*)

A. High Diversification Region:

Area with high diversification was observed in Satara (12.39), Solapur (12.66) and Kolhapur (12.88) district during 2000-01 while during 2018-19 no found districts experienced high diversification of crops. It indicates that cropping patterns was no changed.

B. Medium Diversification Region:

It was no found had medium diversification of crops during 2000-01 whereas during It had medium diversification of crop noticed in Pune (19.25) and Sangali (10.62). It means that there was no change in cropping pattern, but change was observed in Satara (11.24), Sangali (10.24) and Kolhapur (10.86) district in this category during 2018-19.

C. Low Diversification Region:

Low crop diversification was no found during 1990-91 but in 2018-19 it was found in Pune (7.74) districts. In only one district Pune and Satara noticed change from low to high degree of diversification.

Conclusion:

Crop diversification is a crucial technique for comprehending cropping patterns. According to the study, during 2000–01, the districts of Satara (12.39), Solapur (12.66), and Kolhapur (12.88) respectively. This shift as a result of advantageous geographic conditions.

Low crop diversification was discovered in Pune (19.25) and Sangali (10.62) districts in 2000–01, and it was once more observed in Pune districts in 2018–19. Kolhapur witnessed a significant shift in cropping patterns, and the Solapur district saw a high level of crop diversification in 2018–19. This could have been caused by the development of irrigation infrastructure and mechanization in that area. Districts in Satara experienced a shift in 2018–19 from a high to a medium degree of diversification.

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