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Sugarcane Crop Concentration in Sangli District of Maharashtra: A Geographical Analysis

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Abstract:

This study investigates the spatial distribution and concentration of sugarcane crops in the Sangli district of Maharashtra between 2009-10 and 2024-25. Utilizing secondary data sources, the research employs the location quotient method to analyze crop concentration. Findings reveal significant spatial and temporal variations in sugarcane concentration, with notable increases in Palus tehsil and declines in Miraj tehsil. The average concentration index exhibits fluctuations, highlighting dynamic agricultural practices in the region. Overall, the results underscore the changing landscape of sugarcane agriculture and the differing trajectories of various tehsils within Sangli district.

Keyword: Sugarcane, Concentration, Crop Concentration, Sangli District.

Introduction:

Maharashtra is a state that leads in agribusiness. Maharashtra accounts for 10% of the nation's total land area. 308 lakh hectares of Maharashtra state's total land area are used for agriculture.The district has a total geographical area of 8.61 lakh hector, of which 5.41 lakh hector are cultivable. Therefore, around 73.00% of the land is cultivated, with the remaining 8.00% being used for forestry, non-agricultural purposes, pasture land, and miscellaneous plantations. The majority of cultivable land is used to produce food grains (66.13%), sugarcane (14.47%), and fruits and other crops (9.66%).One of Sangli's main cash crops is sugarcane, and the region is well-known for its numerous sugar factories and sugar industry. Recent agricultural data shows that sugarcane was grown on around 23.07% of Sangli's farmed land.Sangli supports the processing of sugarcane with a large number of sugar factories (about 15–18). Cane grows best in talukas like Walwa, where cultivation is focused.

Study Region:

The Deccan plateau and the southern districts of the state of Maharashtra include the Sangli district. Geographically, it is situated between latitudes 160 45' and 170 33' N and longitudes 730 42' and 750 40' E. The district is 553 meters above sea level on average. It is bordered to the north by the districts of Satara and Solapur, to the east and south by the state of Karnataka, to the southwest by Kolhapur district, and to the west by Ratnagiri district. The Sangli district stretches 205 km in length and 96 km in width from east to west. According to the 2011 census, Sangli district has a total population of 28, 22,143, with 14, 35,728 males and 13, 86,415 females. The district's geographical area is 8572

square kilometers. Sangli district has a population density of 329 people per square kilometer and an overall literacy rate of 82.62 percent. The Sangli district comprises eleven tehsils, including Walwa, Shirala, Miraj, Jath, Atpadi, Khanapur, Palus, Kavathe-Mahankal, Tasgaon, and Kadegaon. The district is administratively divided into three sub-divisions, primarily Walwa, Miraj, and Khanapur.

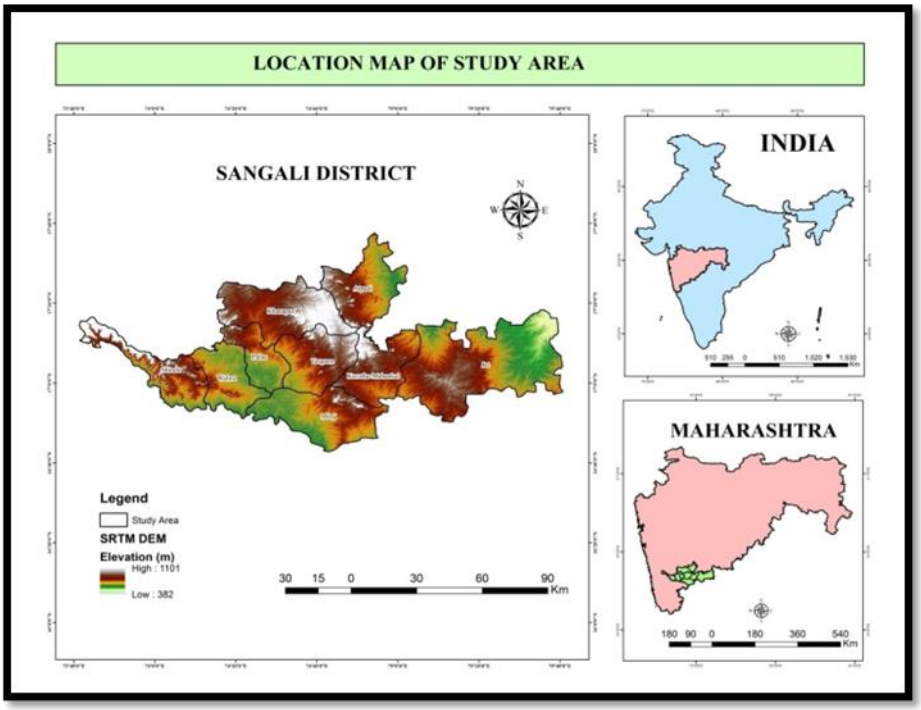

Fig.1 Location Map of Study Area

Objectives:

1. To study the sugarcane crop concentration in Sangli district.
2. To investigate the sugarcane crop's spatial distribution in study area.

Database & Methodology:

The data used in this paper came from secondary sources. The Social and Economic Review Booklet and the District Agricultural Officer Report were the secondary sources of data used to examine the concentration of sugar crops in Sangli district between 2010 and 2024. One typical approach for studying crop concentration is the location quotient method. Bhatia's approach has been used to find the concentration of crops. The crop concentration is calculated using the following formula. The following formula has been utilized for research,

$$\frac{\text{Area of x crop in the component arial unit}}{\text{Area of all crop in the component arial unit}} \Big/ \frac{\text{Area of x crop in the entire region}}{\text{Area of all crop in the entire region}}$$

Table. No. 1: Tehsil wise Sugarcane crop concentration index (Years 2009 -10 and 2024-25)
(Area in percentage)

Sr. No.	Tehsil Name	Year		Change
		2009-10	2024-25	
1	Shirala	1.86	1.21	-0.65
2	Walwa	3.24	2.05	-1.19
3	Palus	0.00	2.42	+2.42
4	Kadegaon	0.00	2.22	+2.22
5	Khanapur	0.54	1.71	1.17
6	Atpadi	0.22	0.27	0.05
7	Tasgaon	0.31	0.68	0.37
8	Miraj	1.64	1.16	-0.48
9	Kavathe-Mahankal	0.25	0.42	0.17
10	Jat	0.12	0.15	0.03
	Average	**0.81**	**1.22**	**0.41**

Source: Based on official information compiled by researcher.

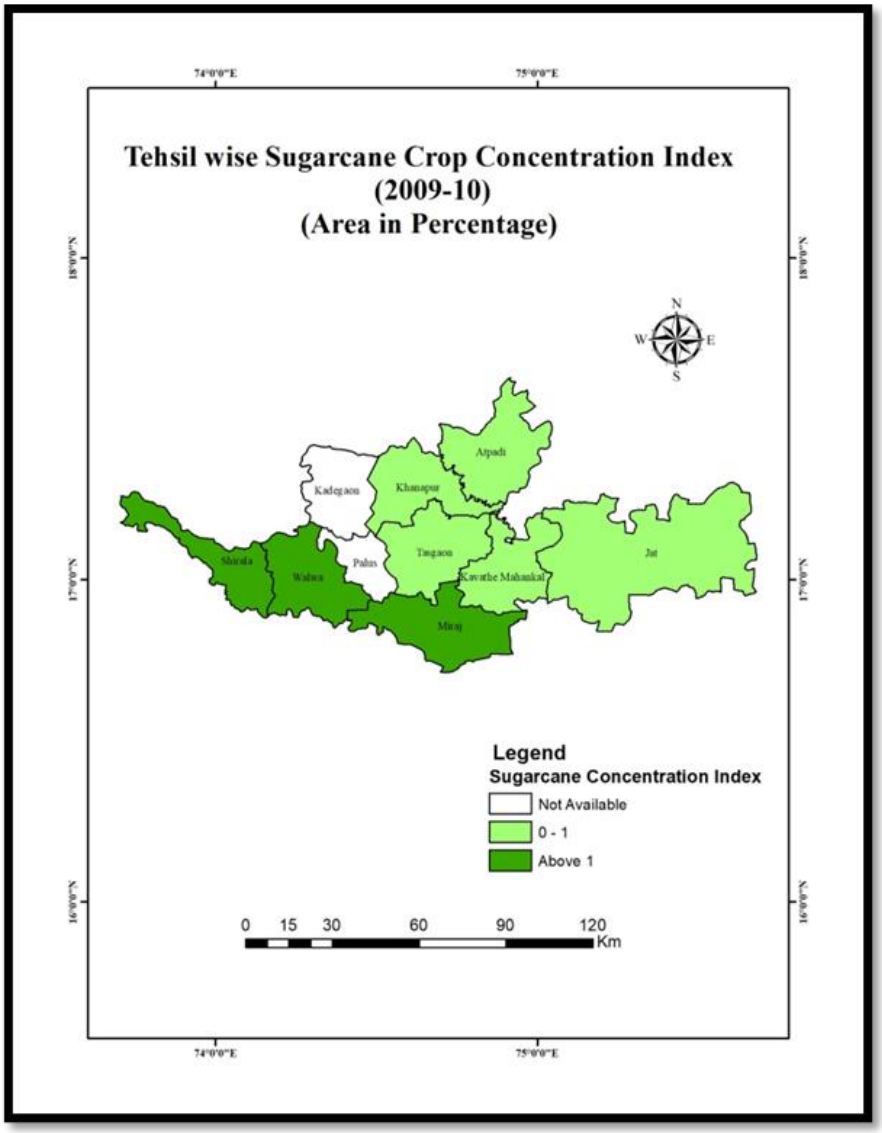

Fig.2 Tehsil wise Crop Concentration Index 2009-10

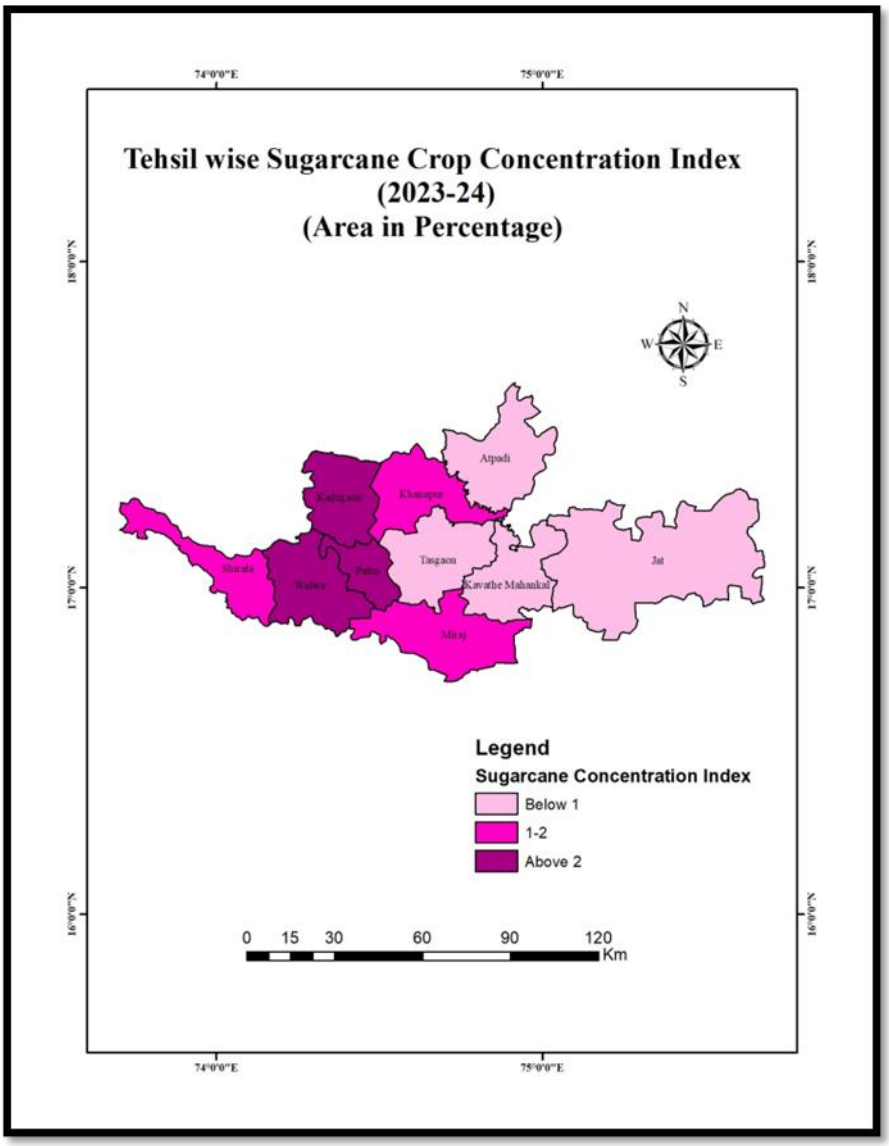

Fig.3 Tehsil wise Crop Concentration Index 2023-24

Discussion:

"Crop concentration means areal density of a single crop" (Jasbir Singh, 1976) "Crop concentration reveals that variation in the density of any crop in a given region at a point of time" (Bhatia 1965). During the agricultural year 2009–10, the mean sugarcane crop concentration index was calculated at 0.81, with a standard deviation of 1.02. The Sangli district's tehsils were divided into three groups according to this statistical distribution:Walawa Tehsil (3.24) has a high concentration (X + 2 S.D.).Shirala Tehsil (1.86) has a medium concentration (X + 1 S.D.). Khanapur (0.54), Atpadi (0.22), Tasgaon (0.31), Miraj (1.64), KavatheMahankal (0.25), and Jat (0.12) have low concentrations (below mean value). The average concentration of sugarcane crops in 2024–2025 is 0.15, with a standard deviation of 0.75.The tehsils of Walawa (2.05), Palus (2.42), Kadegaon (2.22), and Khanapur (1.71) are in the sugarcane high crop concentration index (X+2 S.D.) category. The medium crop concentration index (X+1 S.D.) includes the tehsils of Shirala (1.21), Atpadi (0.27), Tasgaon (0.68), KavatheMahankal (0.42), Jat (0.15), and Miraj (1.16).

Conclusion:

Significant spatial and temporal variations throughout the fifteen years from 2009–10 to 2024–25 are revealed by an analysis of the concentration of sugarcane crops in Sangli district, as shown in Table No. 1 and Figure No. 2. Palus tehsil has experienced the most notable improvement, with a significant growth of 2.42, suggesting its growing dominance in sugarcane agriculture. The concentration index in Miraj tehsil, on the other hand, decreased by –0.48, indicating a relative decrease in specialization towards sugarcane growing, which is the most noticeable negative shift. Beyond these extremes, the district's changing pattern varies. Positive changes in four tehsils—Atpadi, Tasgaon, Kavathe Mahankal, and Jat—indicate a slow growth in sugarcane production in this region.On the other hand, three tehsils—Shirala, Walawa, and Miraj—display negative developments, emphasizing a decline in crop concentration. This regional differentiation highlights the dynamic character of agricultural practices in Sangli district, as some areas are undergoing relative decline while others are solidifying their status as sugarcane-producing zones.

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