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SPATIAL DISTRIBUTION OF CROP DIVERSIFICATION IN SOLAPUR DISTRICT: A GEOGRAPHICAL ANALYSIS

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ABSTRACT

The present paper has been attempted to study, 'spatial distribution of crop diversification in Solapur district: A Geographical Analysis. The study of crop diversification illustrates that there are variations in the cropping practices of the villages. The area on the bank of river is practicing unique cropping pattern whereas in the dry region multiple crops are produced. The main objectives of the present research paper are to analyse the distribution of crop diversification and its importance of agricultural practices in study area.

The crop diversification is numerous variations in the study region. The high crop divarication is recorded in Madha, North Solapur, Mangalwedha, South Solapur and Akkalkot tahsils. Because, these tahsils are located in dry area with away from river catchment area, medium to shallow soil, low rainfall as well as low expansion of irrigation facilities. The low diversification of crops is registered in Barshi, Pandharpur and Malshiras tahsils. Because there is high development of irrigation facilities, black fertile soil resulted as high proportion of sugarcane cultivation in Pandharpur and Malshiras tahsil while in Barshi tahsil there are very low expansion of irrigation medium to low quality of soil resulted as only one or two cultured such as jowar and tur. In short, there are more variations in farming practices in the Solapur district. Because the inadequate and uneven in the irrigation facilities of the district such as cultivation of sugarcane is cultivated in the irrigated areas and jowar, bajara, pulses are cultivated in the rainfed areas.

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Introduction:

In India about 65 per cent of the total population is directly or indirectly engaged in agriculture sector. As population is increasing the pressure of agriculture is also increasing eventually government is taking steps towards increasing the crop production. The attempts are made to increase the yield by improving the traditional methods and using HYV seeds, chemical fertilizers, agricultural mechanization and advance methods of agricultural cultivation and also the land utilization is also changing from single crop to multi crops dependant on the development of irrigation facilities as a region or area. It means that the irrigation is an important determinant to the development of agriculture and the cropping pattern of an area.

Irrigation, rainfall, and soil fertility play a crucial role in determining crop patterns and diversification. Access to improved seeds, fertilizers, and water management technologies influences crop diversification under irrigation. Farmers' decisions to diversify crops are often driven by economic factors, such as market demand and prices.

The agricultural land under different crops in Solapur district is not only having close relation with physio-climatic conditions but also socio-economic and infrastructural facilities are also important for the agricultural practices. In Solapur district having very uneven, uncertain and inadequate and scanty rainfall because Solapur district located in dry and drought prone area. Therefore, irrigation is a significant determinant influenced on the agricultural practices and crop diversification. So, in this research paper is an attempt to make to understand the variations of crop diversification.

The Study Region:

For the present investigation Solapur district is selected as the study area. Geographically, Solapur district is located between 17^{o} 10' to 18^{o} 32' North Latitudes and 74^{o} 42' to 76^{o} 15' East Longitudes with an average altitude of 458 meters on the Deccan plateau. The district situated on the South-East edge of the Maharashtra state and it lies entirely in the Bhima, Sina and Man basins. The district wholly is drained by Bhima River and it's tributaries. Generally, the Solapur district has a flat or undulating topography and covers 14895 km^2 geographical areas, which covers 4.84 per cent of the total area of Maharashtra state. The Solapur district is bounded by Ahmednagar and Osmanabad districts on the North and Osmanabad and Gulbarga (Karnataka) districts on the East. On the South it is bounded by Sangli and Bijapur (Karnataka) districts. Pune and Satara districts have bounded it on the West. For administrative purposes, the district is divided into 11 tehsils viz. Akkalkot, Barshi, Karmala, Madha, Malshiras, Mangalwedha, Mohol, Pandharpur, Sangola, North Solapur and South Solapur. The district lies in the Pune administrative division.

According to Koeppen's climatic classification, Solapur district comes under the category of dry climate i.e. arid and semi-arid. Agro-climatically, the district falls under the rain

shadow region and it is the core part of drought prone area in Maharashtra. Here, average annual rainfall is 488.8 mm. The scanty and uncertain rainfall has adversely affected the socio-economic condition of people.

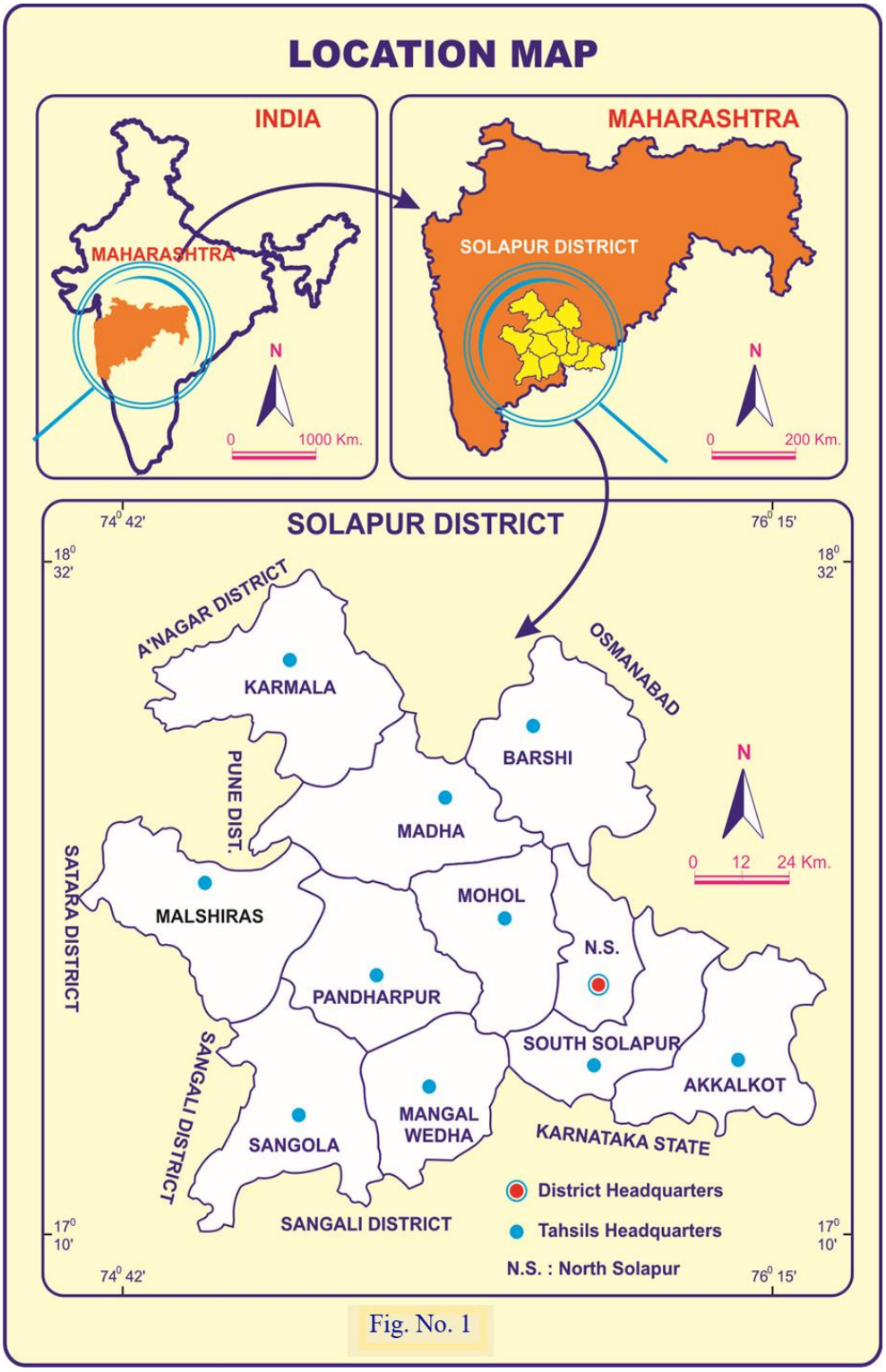

Fig. No. 1

Objectives:

The present study has attempted with the following objectives.

- To examine the spatial distribution of crop diversification in Solapur district.
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Database and Methodology:

The crop diversification in Solapur district is based on the secondary data through the period of 2023-24. The secondary data is collected through Statistical abstracts of Solapur district and Socio-economic reviews.

The detail study of crop diversification is conducted to understand the variations in the study region. In this concern cropping practices with the help of crop divarication techniques are applied for the identification of variations in the crop diversification in the study region with tahsil to tahsil. The collected data about the area under different crops is tabulated, arranged in proper format and statistical methods are applied for the obtaining results. To study the agriculture land use and cropping pattern there are several statistical techniques or methods available which provides truthful results. The details in the cropping practices are studied in a scientific manner using crop diversification methods.

Crop diversification is a concept which is opposite to crop specialization or concentration. To check the crops diversification in the study area are adopted by Bhatia and Jasbir Singh crop diversification method.

For the measurement of crop diversification, Bhatia (1965) developed a formula based on the gross cropped area. The formula has been expressed as:

$$\boldsymbol{Index\ of\ Crop\ Diversification} = \frac{\boldsymbol{Percent\ of\ sown\ area\ under\ x\ crops}}{\boldsymbol{Number\ of\ x\ crops}}$$

Where,

'*x*' crops are those crops that individually occupy 10 per cent or more of the cross cropped area in the area under study.

Crop Diversification in Solapur District, 2023-24:

"Crop diversification is a concept which is opposite to crop specialization" (Hussain, 2004). The farmers in developing countries try to grow several crops in their holdings in an agricultural year. The level of crop diversification largely depends on the geo-climatic, socioeconomic conditions and technological development in a region. "The level of crop diversification largely depends on the socio-economic condition and technological development" (Sharma, 2005). Moreover, socio-economic condition and technological development are mostly depending on the availability of irrigation facilities in an area.

The availability of water for irrigation, the farmers prefer to specialize in agricultural

enterprise while the rainfed and subsistent farmers are generally more interested in the diversification of crops. "Normally high availability of irrigation the use of technology is also resulting in low diversification" (Singh and Dhillon, 1976). The high diversification index is resulting into less crop diversification. While, low diversification index represents high degree of diversification of crops in an area.

There are many geographers have developed techniques for the measurement of crop diversification in an area. Out of that in this study the Bhatia's and Jasbir Singh's techniques are applied for the measurement of crop diversification in the selected villages.

The larger the number of crops having about 10 per cent of a gross cropped area, the higher is the crop diversification in an area. Table-1 represents the outcome of calculations (Diversification Index) of Bhaita's method, for the crop diversification technique.

Table -1
Tahsil-wise Indices of Crop diversification based on Bhatia's method in Solapur District, 2023-24

Sr. No.	Tahsil	Crop Diversification Index	No. of Crops	Degree of Crop Diversification
1	Karmala	20.21	3	Moderate
2	Madha	17.07	4	High
3	Barshi	31.48	2	Low
4	North Solapur	16.59	4	High
5	Mohol	20.66	3	Moderate
6	Pandharpur	36.34	2	Low
7	Malshiras	32.48	2	Low
8	Sangola	25.92	3	Moderate
9	Mangalwedha	16.66	4	High
10	South Solapur	15.13	4	High
11	Akkalkot	15.35	5	High
Solapur District		21.06	3	Moderate

Source: Socio-Economic Abstract of Solapur district, 2023-24

Table-1 shows that the indices of crop diversification in the Solapur district through the period of 2023-24. The crop diversification of the Solapur district having very uneven through the period of 2023-24, because there is high variation in the physiography, climatic condition, soils, drainage pattern as well socio-economic factors are influenced on the cropping pattern in the study region.

The high crop divarication is recorded in Madha, North Solapur, Mangalwedha, South Solapur and Akkalkot tahsils. Because, these tahsils are located in dry area with away from river

catchment area, medium to shallow soil, low rainfall as well as low expansion of irrigation facilities. Therefore, in these tahsils vulnerability to droughts has encouraged farmers to espouse crop diversification as a risk management strategy. By growing numerous crops, farmers can ensure a constant income even in years with unfavourable weather conditions. By rising a variety of crops, farmers can take advantage of different market prices and reduce their dependence on a single crop. Farmers in Solapur district have adopted practices like drip irrigation, inter-cropping, and multi-cropping to optimize water use and reduce crop losses. These practices have helped farmers to improve their crop yields and resilience to climate-related shocks. So, there are high crop diversification.

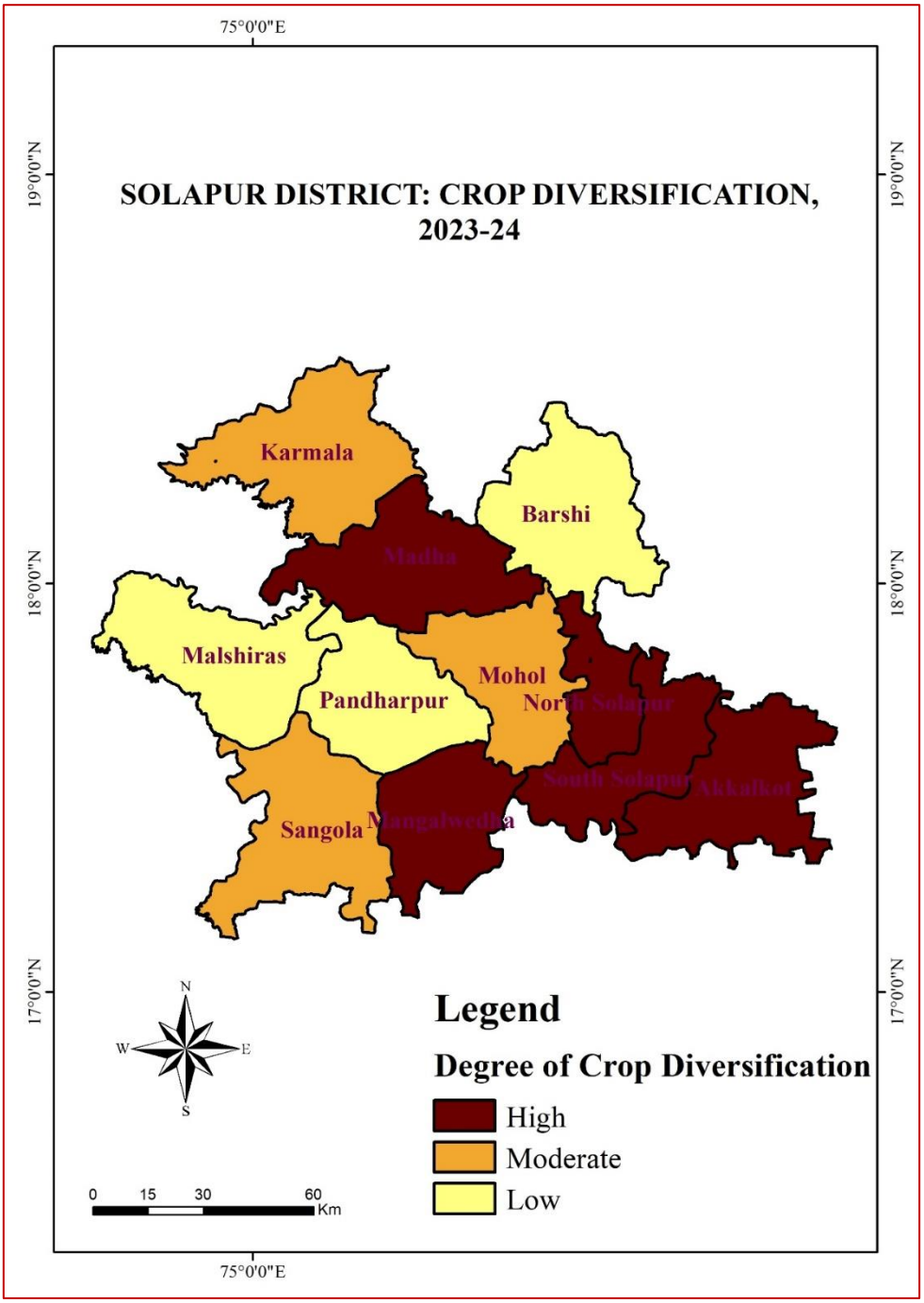

Fig. 2

The moderate crop diversification is noted in Karmala, Mohol and Sangola tahsils.

The low diversification of crops is registered in Barshi, Pandharpur and Malshiras tahsils. Because there are high development of irrigation facilities, black fertile soil resulted as high proportion of sugarcane cultivation in Pandharpur and Malshiras tahsil while in Barshi tahsil there are very low expansion of irrigation medium to low quality of soil resulted as only one or two cultured such as jowar and tur. There is also low crop diversification has helped many farmers mitigate drought-related risks, areas with severe water scarcity might struggle to adopt diverse crops that require more water. Although, small-scale farmers might face challenges in accessing quality seeds, fertilizers, and irrigation facilities, making it difficult for them to diversify their crops. Some farmers might not be aware of the benefits of crop diversification or lack access to training and support services that could help them adopt new farming practices.

In short, It has been observed that the crop diversification highly uneven in Solapur district, because there are high variations in the physiographic and socio-economic determinants such as landscape, drainage pattern, soil, irrigation, etc. resulted as highly uneven crop diversification through the district.

Conclusion:

Solapur district is an agro-based district of Maharashtra. The agricultural landuse of Solapur district is of dynamic nature. Although Bhima, Nira, Sina and Man Rivers passing through Solapur district still a considerable amount of land is utilized for only single crop. The proportion of temporary fallow land is quite high that should be brought under agricultural use. Jowar is the main dominant crop in Solapur. There are more variations in farming practices in the Solapur district. Because the inadequate and uneven in the irrigation facilities of the district such as cultivation of sugarcane is cultivated in the irrigated areas and jowar, bajara, pulses are cultivated in the rainfed areas.

The study of crop diversification illustrates that there are variations in the cropping practices of the villages. The area on the bank of river are practicing unique cropping pattern whereas in the dry region multiple crops are produced. To conclude that the crop diversification is numerous variations in the study region.

Irrigation enables farmers to shift from traditional crops to more remunerative ones, leading to crop diversification. This is evident in the shift from cereal crops to non-cereal crops like oilseeds, vegetables, and fruits. Irrigation enhances crop productivity, making it possible to obtain higher yields and better-quality crops. This, in turn, encourages farmers to diversify their crops to maximize returns. Irrigation reduces the risk of crop failure due to drought or irregular rainfall, allowing farmers to experiment with new crops and varieties.

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