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SPATIAL ANALYSIS OF CROPPING PATTERN IN KOLHAPUR
DISTRICT : A GEOGRAPHICAL STUDY



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ABSTRACT:

The Kolhapur District is agriculturally well developed district in south Maharashtra. Each and every cropping pattern mostly influenced by physical socio-economic factors and pedological conditions. Each crop has maximum, minimum, and optimum temperature. The study of cropping pattern constitutes an important aspect of agricultural geography and it help in the planning and development of the region. The

cropping pattern varies from region to region. The perception and assessment of environment also guide to grow certain crops in a region. Those areas of the world where physical diversities are less, the cropping pattern are less diversified. The present paper is an attempt to analyze how the physical and cultural parameters have an impact on the cropping pattern of the district. The distribution pattern of 10 major crops of the district has been analyzed with a composite crop combination scenario. The paper also attempts to find out the reason behind the low & very high index of crop concentration value of specific crops in specific region. In this paper an attempt has been made to analyze changing cropping pattern from district Kolhapur. In Kolhapur district, agriculture has undergone a number of changes, including new farm machinery, intensive fertilizers, high yielding varieties of seeds, good irrigation facilities etc.

KEYWORDS

Cropping Pattern, Major crops, Crop concentration Index.

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INTRODUCTION :

Cropping pattern is the proportion of area under various crops at a point of time as it changes over space and time. The cropping pattern refers to the system of general crop growing practices in various cropping seasons of a year in any region. (Jadhav S. 2008). Patterns of crop land use of a region are a manifestation of combined influences of physical and human environment. The cropping pattern of a region is closely influenced by the geo-climatic, socio-economic, historical and political factors. (Hussain M, 1996)

The type of cropping pattern depends upon the physical (Such as temperature, soil, rainfall etc.) and cultural (such as economic condition of farmers, size of farm, adoption of new methods, use of seeds, fertilizers or modern equipments) factors. (Jadhav & Suryavanshi, 2008). Cropping pattern means the production of area under various crops at a point of time. It is a dynamic concept because no cropping pattern can be said to be ideal for all times in a particular region. This paper is an attempt to explain the spatial analysis of cropping pattern in Kolhapur district.

STUDY AREA :

The study area of the present investigation is Kolhapur district. Kolhapur district is the southernmost district of Maharashtra. Its headquarter is Kolhapur city which is an ancient city. The city is situated on the banks of the river Panchganga and is known as "Dakshin Kashi". The district is abundant in natural resources, water, soil, natural vegetation, animal wealth and minerals. Kolhapur is one of the most agriculturally advanced districts of not only Maharashtra but also India. It is fast becoming an industrialized district and already a front runner in agro-based industries. The physical setting of the Kolhapur district is divided into three major parts namely eastern ranges, central ranges and southern ranges. Eastern and central ranges have black soil formed from 'lava' and at some places it has large tracts of fertile land. The western ranges are mostly hilly and have red soil. The majority of the area in the west is under thick forest.

The district is located at 15° 45' N to 17° 10' N latitudes and 73° 40' to 74° 42' east longitudes, with a geographical area of 7685 sq. km i.e. 2.49% of the state's area. The district consists of twelve tahsils comprising 1229 villages. According to the census of India 2011, the total population of the Kolhapur district is 38,74,015. Out of this 33% were urban and 67% were rural. The population density is 500/sq. km. Literacy is 82.9% and the sex ratio of the district is 953 females per thousand males.

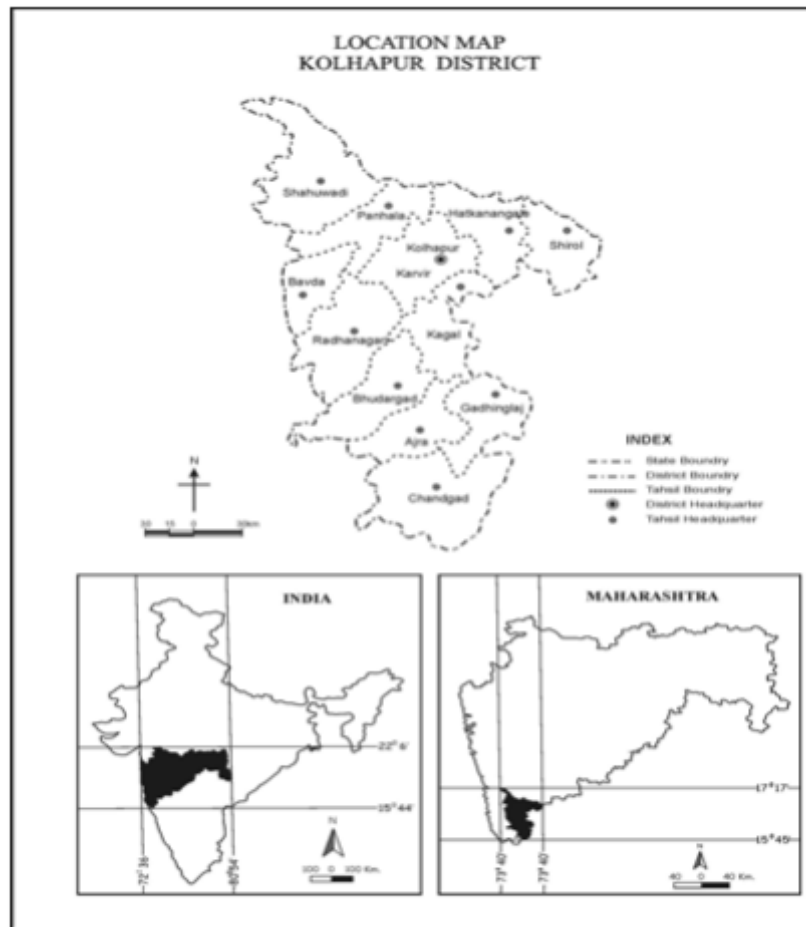


Fig. 1

OBJECTIVES:

- 1.To depict Crop concentration of Kolhapur district 2010-11.
- 2.To understand the area of specialization of different crops grown in the district in 2010-11

DATABASE AND METHODOLOGY :

The work is totally based on secondary data. The data collected from socio-economic abstract of Kolhapur district and department of agriculture development, Zillah parishad, Kolhapur. The relevant information and mapped using suitable techniques and methods. We have selected all Tahsils in Kolhapur district for spatial analysis. The concentration pattern of some important crops like Rice, Wheat, Jowar, Corn, Nagali, Gram, Wal, Sugarcane, Chilly and Groundnut are being discussed here, which would help to analyze the factors determining the cropping prevailing in Kolhapur district.

The Index of concentration of the different crops has been computed on the basis of the Location Quotient method as follows.

$$IOC = \frac{\text{Area under 'X' Crop in a tahsil}}{\text{Gross cropped Area of the tahsil}} \div \frac{\text{Area under 'X' Crop in the District}}{\text{Gross cropped Area of the District}}$$

Crop concentration means the variation in the density of any area at a given point of time. It helps to identify and differentiate area that, has some significance with regards to the crop distribution within the area. The Location quotient method of crop concentration enables the geographers or planners to understand the area of specialization of different crops grown in an area at a given point of time. (Jadhav & others, 2008)

The Index value of the 10 selected crops is computed on the basis of Location quotient method. (Table 2) These Index values are grouped into five categories namely, Nil, Low, Moderate, High and Very High. (Table 3)

| Table No. 1 | | | | | | | | | | | |
|---|--------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|--------------|------------------------------|
| Area under Different crops in 2010-2011 (Percent) | | | | | | | | | | | |
| Selected Crops | | | | | | | | | | | |
| Tahsils | Rice | Wheat | Jowar | Corn | Nagali | Gram | Wal | Sugar cane | Chilly | Ground nut | Total area under Cultivation |
| Shahuwadi | 54.82 | 4.30 | 2.15 | 0.86 | 10.28 | 3.69 | 0.82 | 10.95 | 0.38 | 11.67 | 6.67 |
| Panhala | 38.35 | 1.27 | 6.71 | 0.82 | 5.27 | 3.77 | 1.40 | 33.47 | 1.05 | 8.00 | 7.68 |
| Hatkanangle | 2.97 | 3.17 | 19.72 | 1.90 | 0.17 | 5.20 | 0.68 | 41.32 | 1.00 | 23.86 | 9.26 |
| Shirol | 2.07 | 4.88 | 8.20 | 1.22 | 0.16 | 8.11 | 0.76 | 65.03 | 1.39 | 8.18 | 7.52 |
| Karveer | 27.45 | 1.94 | 4.26 | 0.99 | 1.49 | 2.08 | 0.64 | 46.13 | 0.73 | 14.29 | 11.82 |
| Gaganbavda | 23.74 | 0.49 | 0.00 | 4.23 | 7.87 | 0.00 | 0.72 | 58.94 | 0.72 | 3.28 | 4.75 |
| Radhanagari | 48.09 | 0.41 | 2.72 | 2.36 | 10.71 | 0.00 | 0.30 | 29.92 | 0.51 | 4.99 | 6.71 |
| Kagal | 25.35 | 2.90 | 8.94 | 1.80 | 0.86 | 7.57 | 0.32 | 20.90 | 1.80 | 29.55 | 10.74 |
| Bhudargad | 51.72 | 1.60 | 0.22 | 0.86 | 14.38 | 4.11 | 0.35 | 13.82 | 0.41 | 12.54 | 6.65 |
| Ajara | 36.60 | 5.09 | 2.31 | 2.94 | 14.94 | 6.68 | 0.76 | 9.54 | 1.51 | 19.63 | 6.77 |
| Gadhinglaj | 18.70 | 1.77 | 8.33 | 3.16 | 0.95 | 3.45 | 0.63 | 12.28 | 2.55 | 48.95 | 11.10 |
| Chandgad | 35.98 | 0.36 | 1.04 | 1.03 | 18.85 | 0.00 | 0.49 | 21.90 | 3.25 | 17.12 | 10.33 |
| Total | 29.07 | 2.32 | 5.95 | 1.77 | 6.50 | 3.79 | 0.64 | 29.71 | 1.40 | 18.94 | 100 |

Source : District Socio-Economic Review, Kolhapur 2011

| Table No. 2 | | | | | | | | | | | | |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|---------------|--------------|
| Crop Concentration Index of Kolhapur district 2010-2011 (Percent) | | | | | | | | | | | | |
| Selected Crops | | | | | | | | | | | | |
| Tahsils | Rice | Wheat | Jowar | Corn | Nagali | Gram | Wal | Sugarcane | Chilly | Groundnut | Total | Average |
| Shahuwadi | 1.93 | 2.15 | 0.42 | 0.86 | 1.71 | 1.22 | 1.27 | 0.37 | 0.38 | 0.11 | 10.42 | 1.04 |
| Panhala | 1.31 | 0.63 | 1.34 | 0.81 | 0.87 | 1.25 | 2.18 | 1.15 | 1.05 | 0.07 | 10.66 | 1.07 |
| Hatkanangle | 0.10 | 1.58 | 3.94 | 1.89 | 0.02 | 1.73 | 1.06 | 1.42 | 1.00 | 0.22 | 12.96 | 1.30 |
| Shirol | 0.06 | 2.44 | 1.64 | 1.22 | 0.02 | 2.70 | 1.18 | 2.24 | 1.38 | 0.07 | 12.95 | 1.30 |
| Karveer | 0.93 | 0.96 | 0.85 | 0.98 | 0.24 | 0.69 | 9.94 | 1.59 | 0.73 | 0.13 | 17.04 | 1.70 |
| Gaganavda | 0.79 | 0.24 | 0.00 | 4.22 | 1.31 | 0.00 | 1.12 | 2.03 | 0.71 | 0.03 | 10.45 | 1.05 |
| Radhanagari | 1.65 | 0.20 | 0.54 | 2.36 | 1.78 | 0.00 | 4.69 | 1.03 | 0.71 | 0.04 | 13.00 | 1.30 |
| Kagal | 0.87 | 1.44 | 1.78 | 1.80 | 0.14 | 2.52 | 5.03 | 0.72 | 1.80 | 0.28 | 16.38 | 1.64 |
| Bhudargad | 1.78 | 0.80 | 0.04 | 0.86 | 2.39 | 1.36 | 5.44 | 0.47 | 0.40 | 0.11 | 13.65 | 1.37 |
| Ajara | 1.24 | 2.54 | 0.46 | 2.93 | 2.49 | 2.22 | 1.18 | 0.32 | 1.51 | 0.18 | 15.07 | 1.51 |
| Gadhinglaj | 0.64 | 0.88 | 1.66 | 3.15 | 0.15 | 1.14 | 9.82 | 0.42 | 2.54 | 0.46 | 20.86 | 2.09 |
| Chandgad | 1.24 | 0.17 | 0.20 | 1.02 | 3.16 | 0.00 | 7.66 | 0.75 | 3.54 | 0.16 | 17.90 | 1.79 |
| Total | 12.54 | 14.03 | 12.87 | 22.10 | 14.28 | 14.83 | 50.57 | 12.51 | 15.75 | 1.86 | 171.34 | 17.13 |

Source : Computed by Researcher

Table No. 3
Index of crop Concentration (Values & Tahsils)

| Crops | Nil (< 0.01) | Low (0.01 to 2) | Moderate (2.01 to 4) | High (4.01 to 6) | Very High (> 6) |
|-------------------|--|---|----------------------------------|--|--|
| Rice | - | (12) Shahuwadi, Panhala, Hatkanangle, Shirol, Karveer, Gaganbavda, Radhanagari, Kagal, Bhudargad, Ajara, Gadhinglaj, Chandgad | - | - | - |
| Wheat | - | (09) Panhala, Hatkanangle, Karveer, Gaganbavda, Radhanagari, Kagal, Bhudargad, Gadhinglaj, Chandgad | (3) Shahuwadi, Shirol, Ajara | - | - |
| Jowar | 1 Gaganbavda | (10) Shahuwadi, Panhala, Shirol, Karveer, Radhanagari, Kagal, Bhudargad, Ajara, Gadhinglaj, Chandgad | Hatkanangle | - | - |
| Corn | - | (08) Shahuwadi, Panhala, Hatkanangle Shirol, Karveer, Kagal, Bhudargad, Chandgad | (3) Radhanagari, Ajara, Chandgad | - | - |
| Nagali | - | (9) Shahuwadi, Panhala, Hatkanangle Shirol, Karveer, Gaganbavda, Radhanagari, Kagal, Gadhinglaj | (3) Bhudargad, Ajara, Chandgad | - | - |
| Gram | (3) Gaganbavda, Radhanagari, Chandgad | (6) Shahuwadi, Panhala, Hatkanangle, Karveer, Bhudargad, Gadhinglaj | (3) Shirol, Kagal, Ajara | - | - |
| Wal | - | (5) Shahuwadi, Hatkanangle, Shirol, Gaganbavda, Ajara | (1) Panhala | (3) Radhanagari, Kagal, Bhudargad | (3) Karveer, Gadhinglaj, Chandgad |
| Sugarcane | - | (10) Shahuwadi, Panhala, Hatkanangle, Karveer, Radhanagari, Kagal, Bhudargad, Ajara, Gadhinglaj, Chandgad | (2) Shirol, Gaganbavda | - | - |
| Chilly | - | (10) Shahuwadi, Panhala, Hatkanangle, Shirol, Karveer, Gaganbavda, Radhanagari, Kagal, Bhudargad, Ajara | (2) Gadhinglaj, Chandgad | - | - |
| Ground nut | - | (12) Shahuwadi, Panhala, Hatkanangle, Shirol, Karveer, Gaganbavda, Radhanagari, Kagal, Bhudargad, Ajara, Gadhinglaj, Chandgad | - | - | - |

Source : Computed by Researcher

RESULT AND DISCUSSION :

It is found that , the Index Values of crop concentration is mostly Low and Moderate category. In Kolhapur district Shahuwadi, Panhala, Hatkanangle, Shirol, Karveer, Kagal, Bhudargad, Radhanagari, Gaganbavda, Ajara, Gadhinglaj and Chandgad tahsil has found Low to very high Index of crop concentration. In Shahuwadi tahsil it is observed that , the Index value of Sugarcane and Ground nut are very low, because irrigation facilities are less developed and hilly area of Shahuwadi tahsil. In Panhala tahsil Index value of Wal in high (2.18) and Wheat is very low (0.63). The index value of Jowar crop is very high in Hatkangale tahsil (3.94), because well developed irrigation as well as transportation facilities. In Gaganbavda tahsil the index value of Jowar crop is nil, because it is not regular food in that, area. But index value of corn is high in Gaganbavda tahsil respectively. In Karveer, Gadhinglaj, Chandgad tahsil index values of Wal crop is very high (9.94, 9.82 and 7.66) respectively. The index value of Rice crop is high in Shahuwadi tahsil, because of its regular use in food.

The index values of Wheat crop is high is Ajara tahsil, because climatic conditions is very good for growing wheat crop. In Chandgad tahsil the Index value of Nagali crop is very high, (3.16) because most of area covers hilly and mountains which is most suitable for Nagali crop. In Gaganbavda, Radhanagari and Chandgad tahsil the index values of Gram crop is nil, because it is not regular food crop in that area and also affect climatic condition. Most of areas of Kolhapur district is hilly and not well developed irrigation facilities, soil fertility, distribution and density of population, and demand of agricultural commodities.

CONCLUSION:

The present research paper highlighted that, cropping pattern of agriculture in Kolhapur district is varies from space to space. We have observed that, the cropping pattern in Kolhapur district is diversified because of various reasons and get maximum return from agricultural commodities. Large area covered by the principles crops is Rice, Sugarcane, Wheat, Groundnut and Nagali which are produced on food as well as commercial purpose. High yielding rice, Sugarcane, Wheat, and Nagali are popular and cultivated wherever supply of water is abundant. The cropped area is determined by mainly rainfall and market price. The continuous cultivation of a particular crop leads to progressive reduction in yield. This is needed to adopt rotation of crops with diverse choice, to maintain the fertility of the soil and scientific rotation of crops will make the agro ecosystem more resilient and sustainable. The cropped area of other crops varies from place to place and year to year due to the climatic condition and fluctuation in the prices of the crops.

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