



REGIONAL INEQUALITIES IN THE LEVELS OF AGRICULTURAL PRODUCTIVITY IN KOLHAPUR DISTRICT OF MAHARASHTRA

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Abstract:

Over populated country like India even in this era of science and technology heavily relied on agriculture sector. When horizontal expansion of agriculture finds some limitations, everyone has to think about the vertical growth of agriculture i.e., increase in the agricultural productivity. Agricultural productivity is a performance of various crops, with respect to available social, cultural and natural resources in a selected area.

Kolhapur district is endowed with very rich flora and fauna, along with social, cultural, economic and technological elements. Even though, there are some spatial disparities are seen in the agriculture sector. Therefore, it is essential to find out these disparities in the form of agricultural productivity, which will help to ascertain the ground reality and to suggest appropriate remedial measure.

For measuring the levels of agricultural productivity in the study region, Kendall's Ranking Coefficient method is used. To measure the linear relationship in between two variables i.e., agricultural productivity and agricultural facilities in the study region, Karl Pearson's Coefficient of Correlation is also used. The inequalities in the spatial distribution of agricultural productivity are analyzed for the year 2018-19. Finally, on the basis of distribution of levels of agricultural productivity, remedial measures are also suggested to eradicate these disparities.

Key Words: *Agricultural Productivity, Regional Inequalities, Ranking Coefficient, Coefficient of Correlation, Spatial Distribution.*

Introduction:

The developing country like India is still largely relied on agriculture and the development of agriculture is closely related with the agricultural productivity. Agricultural productivity is studied and

defined in various fields by several scholars in their own disciplines with their own views. As far the agricultural geography is concerned, agricultural productivity is defined as the measurement of agricultural production and the inputs

required. In other words, agricultural productivity is a ratio of inputs and outputs (Shafi, 1984). Agricultural productivity is frequently associated with the several factors like physical, economic, social, cultural and technological. In the earlier days the role played by the physical factors attracted more attention of the researchers, but today, it has been depleted and the dynamic factors like economy, socio-cultural background and the technology are at the center. However, the attempts are being made to increase the agricultural productivity through controlling the physical factors by adopting modern technology along with the use of hybrid seeds, fertilizers, fungicides, pesticides and the modern irrigation techniques. Productivity of land is a very important factor of agriculture because, it provides foodstuff in terms of output for the whole population of the nation along with the employment opportunities for the rural community.

As far the agricultural geography is concerned, spatio-temporal analysis of agricultural productivity is very important, because it can highlight the trend, structure and the problems associated in a particular region. On the basis of this analysis appropriate policies can be made by the policy makers and suggested to the government and the agricultural departments. Agricultural development is

of prime importance for every country of the world, which is ultimately associated with the crop production, that's why, every country of the world tries to maximize its production of agriculture. Owing to the various factors influencing the agricultural productivity, regional imbalances, inequalities or disparities are created. The measurement of agricultural productivity helps in knowing the high, moderate and low agricultural productivity regions in the study area. By delimiting the regions of inequalities, plans are prepared to ascertain the ground reality and to take further action. In this research paper an attempt has been made to delimit the regions of agricultural productivity in Kolhapur district and to suggest the remedial measures to increase agricultural productivity for the eradication of regional inequalities.

Objectives:

The major objectives of the present study are to assess the regional inequalities in the agricultural productivity and to suggest the remedial measures to increase the agricultural productivity in the Kolhapur district of Maharashtra.

Methodology:

The present research work is based on the secondary sources of data. For measuring the agricultural productivity and agricultural facilities index Kendall's

Ranking Coefficient is used. With the help of ranking position of every tahsil of every crop, the average rank for every tahsil is calculated and arranged in an ascending order or array. For knowing the patterns of inequality, the array is divided into three equal parts i.e., high, moderate and low agricultural productivity. To calculate the Ranking Coefficient Index following formula is used.

$$RCI = \frac{R_1 + R_2 + R_3 + \dots + R_n}{N}$$

Where,

RCI- Ranking Coefficient Index.

R- Productivity rank of individual crop of particular tahsil.

N- Number of crops of particular tahsil.

To measure the linear relationship in between two variables i.e., agricultural productivity and agricultural facilities, Karl Pearson's Coefficient of Correlation is used. The value of coefficient always lies in between -1 and +1. When two variables change in the same proportion, it is a case of perfect correlation and it can either -1 or +1. When there is no correlation in between two variables, the value of coefficient is zero. And coefficient value ranges in between zero to -1 and +1, is called limited correlation. To calculate the coefficient of correlation following formula is used.

$$r = \frac{E_{xy}}{\sqrt{E_{x^2} E_{y^2}}}$$

Where,

r- Coefficient of correlation.

x- First variable i.e., agricultural productivity.

y- Second variable i.e., agricultural facilities.

Geographical Profile of the Study

Region:

The study region i.e., Kolhapur district is socially, culturally and economically important district of Maharashtra. Which is situated in the southernmost part of Maharashtra and forms the part of sub-mountain zone of Sahyadri ranges. The district is divided into three geographical or agroclimatic regions i.e., mountain or ghat region, submountain region and plain region. It is drained by the rivers Panchaganga, Krishna, Warna, Vedaganga, Dudhaganga, Bogavati, Ghataprabha and Malaprabha.

Kolhapur district is surrounded by Sangli district in the north, Ratnagiri and Sindhudurg districts in the west and Belagavi district in the south and east. The district occupies 7685 sq. kms. area sharing 2.62% total area of Maharashtra. It lies in between $15^{\circ} 43'$ to $17^{\circ} 10'$ north latitude and $73^{\circ} 40'$ to $74^{\circ} 42'$ east longitudes (fig. no.1). the district extends 160 kms. in the north-south and 60 kms in the east-west. It consists of 12 tahsils and 1203 villages. The district has a population of 38,76,001 of which 19,80,658 are males and 18,95,343 are females forming a sex ratio of 1000:957. The district has a density of 504 persons per sq kms along

with the literacy rate of 72.91% (Census 2011).

The altitude of the region ranges in between 350 to 650 mts along with the rainfall of 550 to 6000 mms range. The district is very rich in flora and fauna differently in different regions. It also has a diversity of forest cover, with evergreen forests in the west to deciduous vegetation in the east. The study region is occupied by variety of soils i.e., deep lateritic soils in the west to black soils in the east along with the alluvial soils in the river basins. As far the agriculture is concerned, along

with rice and groundnut, sugarcane is the identification crop of the district in the state due to its agroecological situation and productivity. Every tahsil of the district has different agroecological situation with its own production system, technological variations and different agricultural facilities. Western part of the study region is having the dominance of crops like paddy, nagali, cashewnut, groundnut, soyabean and fruits, on the other hand, the dominance of crops like sugarcane along with groundnut, soyabean, jowar, banana, and vegetables is seen in the east.

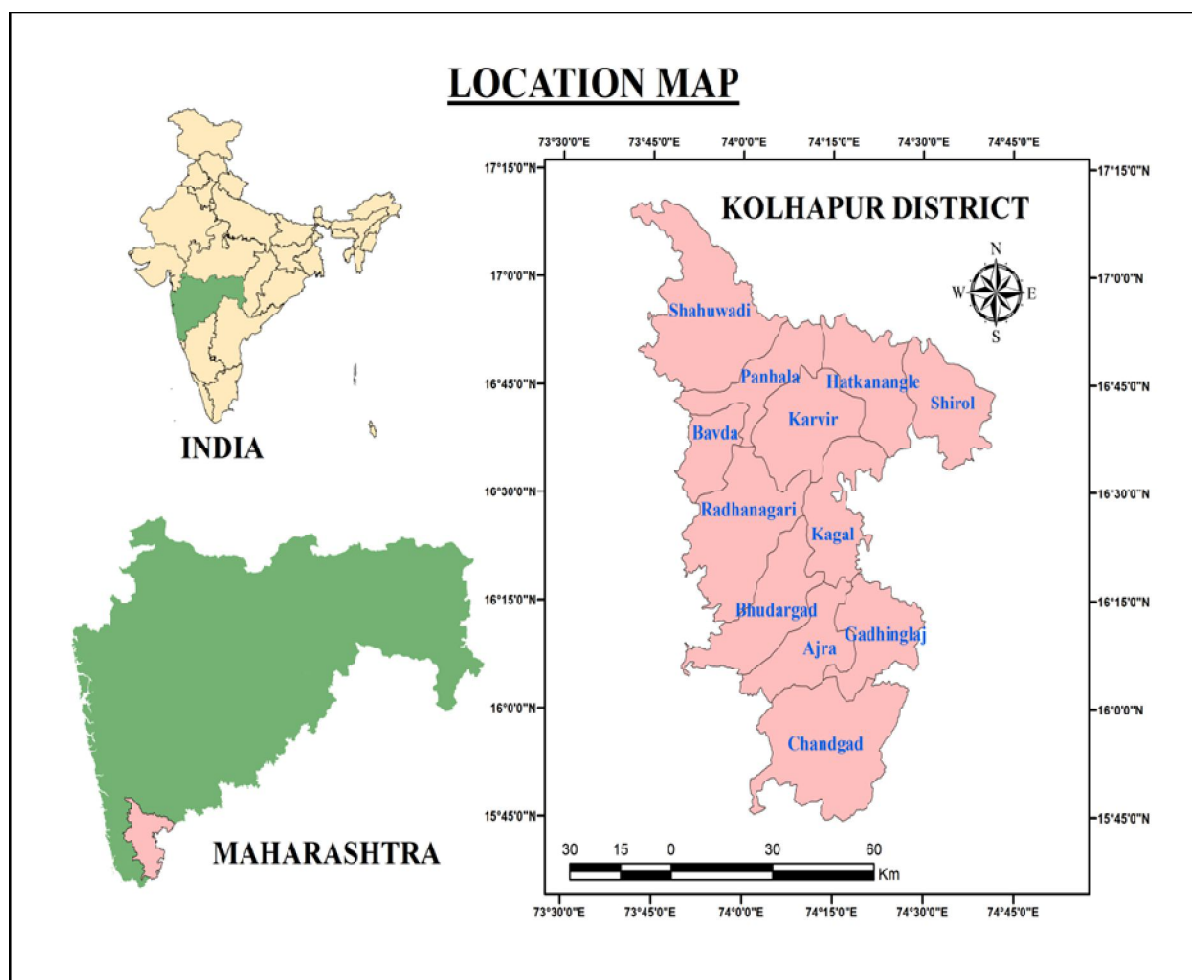


Fig No 1 – Location of the Study Region

Levels of Agricultural Productivity:

The levels of agricultural productivity of Kolhapur district have been delineated with the help of Kendall's Ranking Coefficient method. The ranking coefficient after Kendall have been calculated for different tahsils to find out the level of agricultural productivity for every tahsil. The array of ranking

coefficient is arranged in the ascending order, which is divided into three equal categories to obtain high, moderate and low levels of agricultural productivity. With the help of obtained agricultural productivity index values the categories are made and distribution map is prepared (Fig No 2).

Table No 1 : Levels of Agricultural Productivity

Sr. No	Level of productivity	Range of Rank	Incorporated Tahsils
1	High Productivity	Less than 04	Panhala, Karveer
2	Moderate Productivity	04 to 08	Hatkangale, Kagal, Gadhinglaj, Chandagad, Bavada, Shirol, Shahuwadi, Bhudaragad, Radhanagari
3	Low Productivity	Greater than 08	Ajara

High Agricultural Productivity Region:

It can be observed from the fig no 2 that, the area of high agricultural productivity is found in the upper river basins of Warna and Panchaganga. The tahsils namely Pnhala and Karveer are having high agricultural productivity in the district. Sugarcane, paddy, groundnut, soyabean and vegetables are some of the dominant crops in these tahsils. It is more important that, over 70% area of cultivated land of these tahsils is under irrigation. These tahsils are having more than 70% literacy rate, which is highly supportive to the adoption of new agricultural

innovations. These tahsils are also having the agricultural facilities of high percentage, which includes irrigated area, agro service centers and credit institutes. Along with these cultural elements, these tahsils are endowed with medium black to deep black soils, ample rainfall and pleasant temperature.

Moderate Agricultural Productivity Region:

The areas of moderate agricultural productivity are generally found in the vicinity of high agricultural productivity

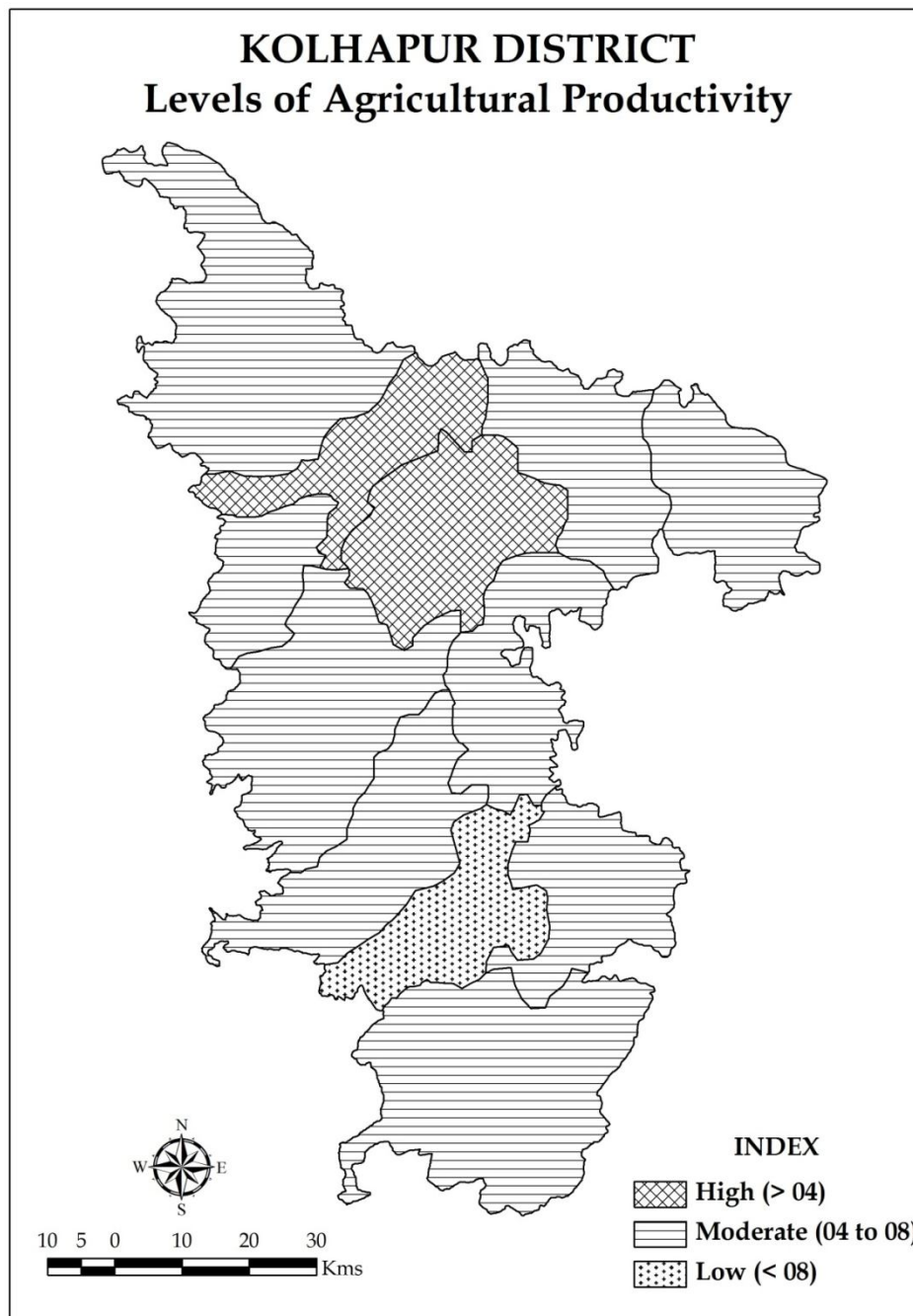
regions. The tahsils namely, Hatkangale, Kagal, Gadhinglaj, Chandagad, Bavada, Shirol, Shahuwadi, Bhudaragad and Radhanagari comprises moderate agricultural productivity region. Hatkanagale, Kagal and Shirol tahsils are having plain terrain with some minor exceptions. On the other hand, the tahsils namely, Shahuwadi, Bavada, Radhanagari and Bhudaragad are located in the ranges of Sahyadri. Gadhinglaj and Chandagad located in the south of the district having submountain terrain. The tahsils which are having mountain and submountain terrain, they are drained by the local rivers providing assured water supply to the agriculture. The number of agricultural facility centers and the credit institutions are also played an important role in the moderate agricultural productivity. The quality of soils and annual rainfall makes considerable impact on the production of

paddy, nagali, maiz. Gram, and sugarcane in the west, while, the tehsils in the east and south dominated with sugarcane, paddy, groundnut, wheat and vegetables.

Low Agricultural Productivity Region:

Ajara is the only tahsil, which is having low agricultural productivity in the district with 9.50 average ranking coefficient. This particular tahsil is located in and around the major spur of Sahyadri running in north-west south-east direction. The tahsil is having very poor conditions of irrigation, agro service centers and credit institutions. Undulating terrain, heavy rainfall (3000 to 6000 mm) and low-quality light soils also make a heavy impact on the agricultural productivity of Ajara tahsil. Paddy, nagali, cashew nut, sugarcane and ground nut are some of the dominant crops grown in this tahsil.

Fig No 2 – Level of Agriculture Productivity



Conclusion and Remedial Measures:

The above analysis reveals that, there are some regional inequalities in the agricultural productivity of Kolhapur district. The ranking coefficient which is calculated with the help of Kendall's

method, varies in between 3.12 to 9.50 for 12 tahsils of the district. According to Kendall's Ranking Coefficient, obtained values are arranged and divided in to three equal parts i.e., less than 04, 04 to 08 and greater than 08, showing high, moderate and low agricultural productivity. Out of total area of the district 16.66% area is

having high agricultural productivity. On the other hand, 8.33% area is occupied by the low agricultural productivity. Remaining major part of the district i.e., 75.00% study region experiencing medium or moderate agricultural productivity.

Panhala and Karveer tahsils of the district with 3.12 and 3.62 coefficient values comprises a region of high agricultural productivity. At the other end of the scale, Ajara a single tahsil with 9.50 coefficient value forms low agricultural productivity region. The tahsils Hatkangale(4.57), Kagal(4.75), Gadhinglaj(4.77), Chandagad(5.00), Bavada(5.50), Shirol(6.00), Shahuwadi(6.22), Bhudaragad(7.16) and Radhanagari(7.50) are the part of huge moderate agricultural productivity region. It is important to note that the regional disparity in the agricultural productivity at tahsil level reveals some resemblance with the physiography and climate of the study region. The coefficient of correlation in between agricultural productivity and agricultural facilities (i.e., irrigated area, credit institutes and agro service centers) is 0.73, which shows moderate and limited correlation.

Finally, the above discussion shows that, physiographical, climatic, economic and socio-cultural determinants have shown their deep impact on the agricultural productivity of the study

region. To eradicate these regional inequalities in the district, some long-term steps have to be taken at tahsil, district and state levels. Proper planning is needed to increase the agricultural productivity of the tahsils, which are having moderate and low level of productivity. Assured irrigation, banking facilities, fertilizers, HYV seeds and market facilities should be provided at the hand of farmers. Besides other commodities rice, groundnut and sugarcane are the identification mark of the district due to its agricultural productivity. That's why, special insight is needed for these three important commodities.

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