Spatial Pattern of Agricultural Development in Aurangabad District

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Abstract

In India near about 70 % population is working on agriculture and related sectors and in rural its percentage is 80 %. Agriculture is the backbone of the Indian economy therefore it is important and necessary to the study of agriculture while the study of development. The development of agriculture in the entire country is uneven and found disparity.

The present paper has an attempt the spatial pattern of agricultural development in Aurangabad District of Maharashtra state.

Keywords

Spatial pattern, Z Score, Agricultural development, high, moderate, low

Introduction

Agriculture plays a vital role in the Indian economy. Over 70 per cent of the rural households depend on agriculture. Agriculture is an important sector of Indian economy as it contributes about 17% to the total GDP and provides employment to over 60% of the population (Kekane Maruti Arjun, 2013).

The present research reveals the tahsilwise interpretation of spatial pattern of agricultural development in Aurangabad district with the help of 5 indicators, i.e. iron plough, electrical pump used for irrigation, numbers of tractors, gross cropped area to the total geographical area and percentage of irrigated area to net sown area.

Study Region

The study region Aurangabad district is located in the state of Maharashtra. The district is a part of Aurangabad division and main district in the division; it is situated in between $19^0 23'43''$ N to $20^0 39'36''$ N latitude and $74^0 36'46''$ E to $75^0 57'03''$ E longitudes. The district cinsits total 9 thasils and having total population 3701282, out of them 1924469 are male and 1776813 are female according to the year 2011 census.

Jalgaon district on north, Jalana district on east, Bid district on southeast, Ahmadnagar district on south and Nashik district towards west of the study region.

Objectives

The specific objectives of the present research paper as follows,

i) To measure and determine the spatial pattern of agriculture development in Aurangabad district
ii) To identify the regional disparities in the level of agriculture development in the study region.
iii) Find out the relationship between agricultural population and agricultural development.

Data Collection Source & Research Methodology

The secondary data has been used to complete the present study. The secondary data collected from the District Office of Agriculture, Aurangabad and Socio-economic Review of the Aurangabad District 2016.

The level of agricultural development has been determined on the basis of five variables.

X1 – Numbers of iron plough

X2 – Number of electrical pump used for irrigation
X3 – Numbers of tractors
X4 – Percentage of gross cropped area to the total geographical area
X5 – Percentage of irrigated area to net sown area

By using the data above five variables the standard Z-score and composite scores were calculated. Z-score is calculated by using following formula

$$Z\text{-score} = Xi – X / O$$

Where,
Z = Standard score for observation
Xi = Original value of observation
X = Average of all values of X
O = Standard deviation of X

With the help of Z-score composite scores were calculated by using following formula

$$\text{Composite Score} = X1 + X2 + X3 + X4 + X5$$

Spatial Pattern of Agricultural Development

Table No 1 shows the z-score and their composite score of all indicators. Composite score determines the level of agricultural development of the entire district.

Table No 1
Aurangabad District: Z-score and Composite Score of all Indicators

Tahsil Name	X1	X2	X3	X4	X5	Composite Score
Kannad	2.05	1.95	1.77	1.32	0.16	7.25
Soygaon	1.46	1.58	1.46	1.47	0.64	6.61
Sillod	1.89	2.01	1.85	1.74	0.81	8.3
Phulambri	1.59	1.59	1.59	1.96	0.85	7.58
Aurangabad	1.65	1.88	1.95	2.02	1.16	8.66
Khultabad	1.32	1.66	1.51	2.09	0.77	7.35
Vaijapur	2.01	2.05	2.11	1.98	0.99	9.14
Gangapur	1.41	1.45	1.65	2.04	1.21	7.76
Paithan	1.73	1.71	2.04	1.56	1.04	8.08

Source: - Calculated by Author

The composite score is divided into three categories to determine the level of agricultural development. The tahsils scored composite score more than 9 considered as high agricultural developed region, tahsils scored composite index 7 to 9 considered as moderate and the composite score below 7 as low agricultural developed region

High Agricultural Developed Region

In the entire district only Vaijapur tahsil found the high development of agricultural development according to the composite score. This tahsil contains highest number of iron ploughs, electrical pumps and no of tractors. Also more than 80 % land is in agriculture use also more than 25 % land is under irrigation and all these helps to develop the agriculture pattern in this tahsil.

Manmad to Aurangabad-Jalna railway line passing through this tahsil also State Highway no 16, 47 and 60 are passing from the tahsil. All these are provides the accessibility for the good transport and all these helps the development of agriculture in this tahsil.

Moderate Agricultural Developed Region

The maximum tahsils in the region has the moderate level of agricultural development. Kannad, Sillod, Phulambri, Aurangabad, Khultabad, Gangapur and Paithan tahsils has the moderate level of agricultural development. Near about 77.78% part of the study region is under development and till need to the development of agriculture.

In the moderate group Kannad tahsil observed the lowest score i.e. lowest agricultural development in this category. Kannad tahsil having good numbers of iron ploughs and electric pumps in irrigation also more than 70% land is in agriculture use but percentage of irrigation is low compare to other tahsils in this category. Therefore the composite score of z-scores is low in moderate development category.

Khultabad, Phulambri and Gangapur tahsil observed the minimum composite score after Kannad respectively. The composite score of these tahsils is in between 7 to 8. In Gangapur tahsil the growth rate ate of urban population is high compare to other tahsils. The maximum urban population is situated in Aurangabad tahsil but growth rate is higher in Gangapur tahsil during 1991-2001 and 2001-2011. The MIDC sector and also industries are developed in the northeast part of tahsil therefore the maximum working population concentrated toward in this sector. Gangapur tahsil has the more than 70% land under agriculture but low numbers of iron ploughs, electrical pumps and tractors. Therefore it found the pattern of agriculture is not well developed in this tahsil. The disparity found in the development of every tahsil of this category.

Low Agricultural Developed Region

The low level of agricultural development found in Soyagaon tahsil, this is only tahsil in the region has the lowest composite score below 7. This tahsil located on the north of the district and the average height of this region is more than 600 meter also this region covered forest area. All these affect the pattern of agriculture in this region, the tahsil covered near about 73% under agriculture but it is lowest in the district also percentage of irrigation is lowest compare to other tahsils in the region. Soygaon tahsil observed only more than 100 tractors while it is more than 200 in other tahsil. The innovative techniques of agriculture till not developed also the pattern of cultivation is not modified in this tahsil. Therefore the overall pattern of agricultural development is low in the entire district.

Map No 1 shows the location and the tahsilwsie pattern of agricultural development of the study region.
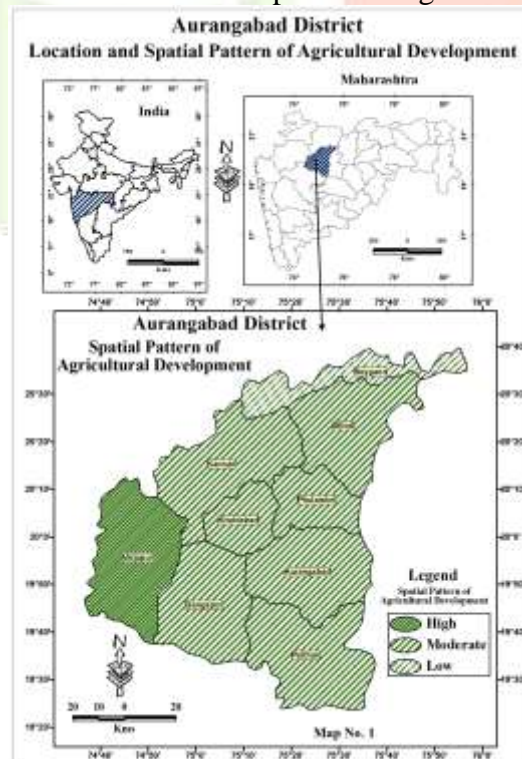
Relationship between Agricultural Population and Agricultural Development

The correlation between the populations in agriculture and the level of agricultural development is observed positive and it is a moderate degree (r = + 0.62). The changes in these two variables are in same direction but speed is different because it is moderate degree. The speed of development is slow than the agricultural population. The correlation between these two variables is shown on regression line (Graph No 1).

Aurangabad District
Relationship between Agricultural Population and Agricultural Development

$y = 1E\text{-}05x + 6.5066$

Graph No 1

(r = + 0.62)
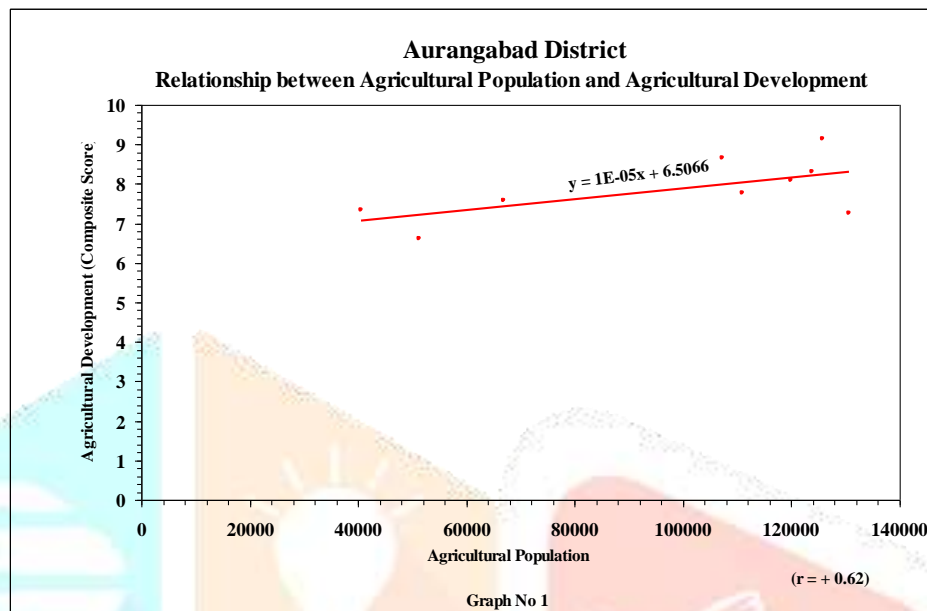
Conclusion and Suggestions

Overall development of the agriculture in the district is moderate because more than 75 % tahsils in the region observed moderate development. The development of industries is good but it affects the development of agriculture in Gangapur tahsil. The agro based industries percentage should be increased in Gangapur tahsil, it will helps to the development of agriculture pattern in this tahsil.

The pattern of development is not uniform because the distribution of indicators is also uneven. In the district only Vaijapur tahsil has the high agricultural development according to the composite score. But the distributions of development indicators are also not uniform in this tahsil. It is essential to develop the pattern of cultivations, increases the no of tractors in this tahsil to complete development.

The physical factors are affects the pattern of agricultural development, Soygaon tahsil has the lowest development of agriculture in the district. The advance techniques of cultivations, cropping pattern should be progress in this tahsil to increase the development of agriculture.

The study region is the part of rain shadow region; therefore the rainfall is unfixed in the district. Therefore the agriculture population should be tries to the crops in minimum water consumption also farm ponds, rain water harvesting etc can be increases the storage of water level and it all helps the pattern of agricultural development of the region.

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