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A Geographical Analysis of Intensity and Levels of Development in Tribal Area of Nashik District in Maharashtra

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1.0 Abstract:

India's food production is increasing every year and India is leading in production of many crops like wheat, rice, pulses, sugarcane and cotton. It is the largest producer of milk and the second largest producer of fruits and vegetables. In 2013, India contributed 25% to world pulses production, the highest for any single country, 22% to rice production and 13% to wheat production. It also accounted for about 25% of the total quantity of cotton produced, besides being the second highest exporter of cotton for the past several years. Considering the concentration of production or the intensity of agriculture per unit area and time, it may be easier to analyze agricultural growth in a subsistence economy. This approach to agricultural intensification is inherent in many growth arguments and is consistent with their purpose. The limited production data from different subsistence economies requires the use of surrogate measurements of intensity based on various input factors.

Keywords: Intensity, Levels of Development, Tribal Area

1.1 Introduction:

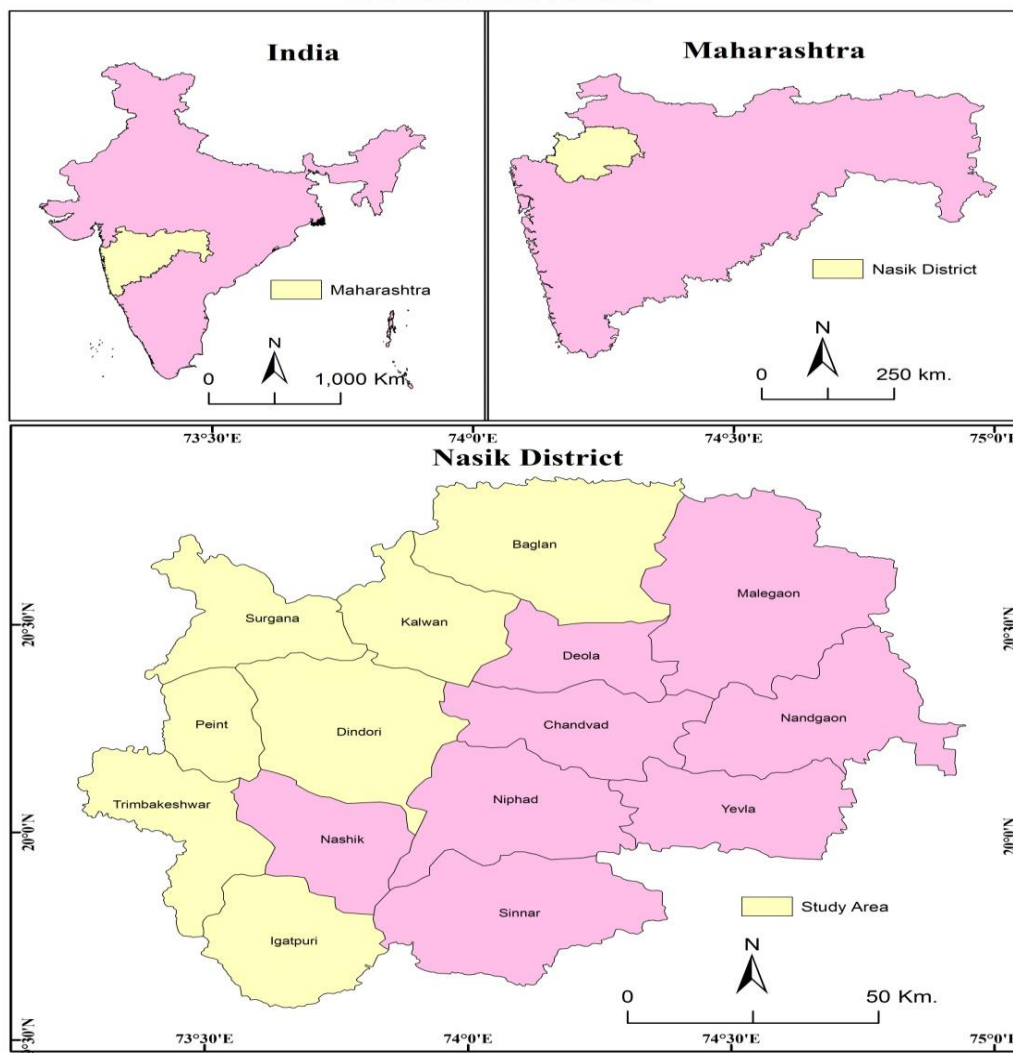
The present study deals with the agricultural development in tribal areas of Nashik district of Maharashtra. Agriculture is the main occupation of tribal population and the only source of their income. Recently new methods of agricultural techniques as well as various state government schemes being adopted but it is still variations in different tribal areas of the district. Agricultural Productivity is a multidimensional concept, which includes technological advancement, effective management of available resource and organization for agricultural production. Therefore agricultural productivity is a function of the interplay of physical and cultural variables and it expresses itself through per hectare productivity and the total production.

The agricultural development and growth in agricultural productivity is significantly variable widely across the tribal areas of Nashik district.

1.2 Study Area:

The present paper deals with the agricultural productivity and intensity in tribal areas of Nashik district of Maharashtra. The tribal area of the Nashik district extend between $19^{\circ}34'$ to $21^{\circ}23'$ North Latitude and $73^{\circ}14'$ to $74^{\circ}24'$ East Longitude with an area of 6807 Square kilometer. In 2011 census the population of the study area was 1616096 persons.(26.46 percent of the total population of the district) of which 823153 or 50.93 percent were male and 792943 or 49.07 percent were female. The sex ratio of the study area is 963. The area has only 38.00 percent urban population and remaining 62 percent people live in rural areas The climate of the study area is generally dryness throughout the year except during the south –west monsoon season Normal annual rainfall varies from 500 to 3400 mm. The study area forms varied physiography topography parts of western ghat and Deccan Plateau. The study region consists of satmala, selbari and Dolbari hill ranges. Godavari, Darna, Damanganga, Nar, Par, Girna, Kadva, and Vaitarna are the major rivers drained in the study areas.

LOCATION MAP



1.3 Objective:

The main objective of this study is to determine the imbalance in agricultural Intensity and Levels of Development in Tribal Area of Nashik District Maharashtra.

1.4 Database and Methodology:

In the present study agricultural Level of intensity of cropping with the help of Bhatia's method.

$$\text{Intensity of cropping} = \frac{\text{Gross cropped area}}{\text{Net sown area}} \times 100$$

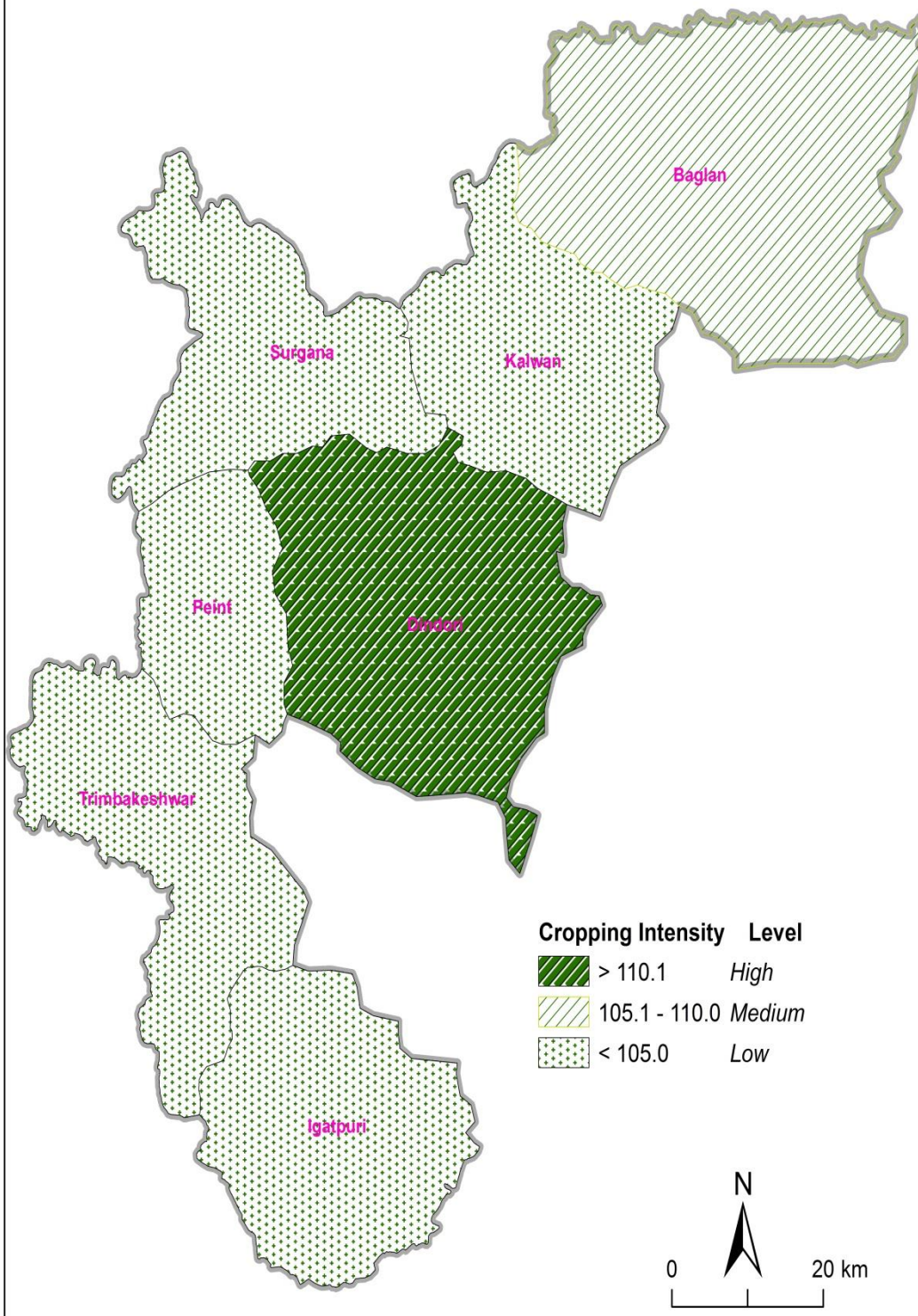
The present study is based on primary as well as secondary data which are obtained from field work and District Statistical Handbook of Nashik district. The tribal area are taken as a unit of analysis. The level of development influenced by various aspects such as physical, socio-economic, technological and organizational factors. In order to describe the spatial pattern of agricultural development in tribal composite Z scores and principal component analysis method used for level of development. The Z score is obtained by the following formula using 14 variables Z score is calculated for the analysis.

$$Z = \frac{X - X^-}{SD}$$

The study of intensity of cropping reflects the above physical and socio-economic condition influencing agriculture and helps in a particular area in planning. An attempt is made in the study area to identify the level of intensity of cropping with the help of Bhatia's method.

$$\text{Intensity of cropping} = \frac{\text{Gross cropped area}}{\text{Net sown area}} \times 100$$

Intensity of Cropping in Tribal Area of Nashik District 2010-11



Data Source: Computed by Researcher

Table 1.1 Intensity of cropping of tribal areas in Nashik district, 1970-71-2010-11

Tehsil	Intensity of Cropping				
	1980-81	1990-91	2000-01	2010-11	2020-21
Peint	100.2	100	100.1	101.7	101.9
Dindori	103.02	108	104.2	107.6	111.8
Surgana	100.01	100.7	100.3	100.3	101.4
Kalvan	105	108.5	108.1	114	104
Baglan	108	109.5	106.6	106.8	107.2
Igatpuri	100	103.5	103.4	105.1	104.6
Trimbak	--			100.8	100.7
Total Area	103.8	106.3	104.7	105.9	105.6

Source:: Socio- Economic Review and Statistical abstract of Nashik district from 1980-81 to 2020-21

Here an attempt has been made to find out the influencing factor in the growth of cropping intensity, bi-variate correlation analysis was done considering intensity of cropping as dependent variable Y and considering a number of varieties as independent variable X. The series of independent variable were population density, percentage of literacy, percentage of area under irrigation, percentage of area under cash crops etc. The analysis results in the correlation co-efficient (r) value of cropping intensity with population density in the year 2011 appear as 0.32 which indicate that there is slight positive correlation between the two as shown in figure 1.3 It shows that population pressure increases the intensity of cropping also increases because more demand of agricultural product.

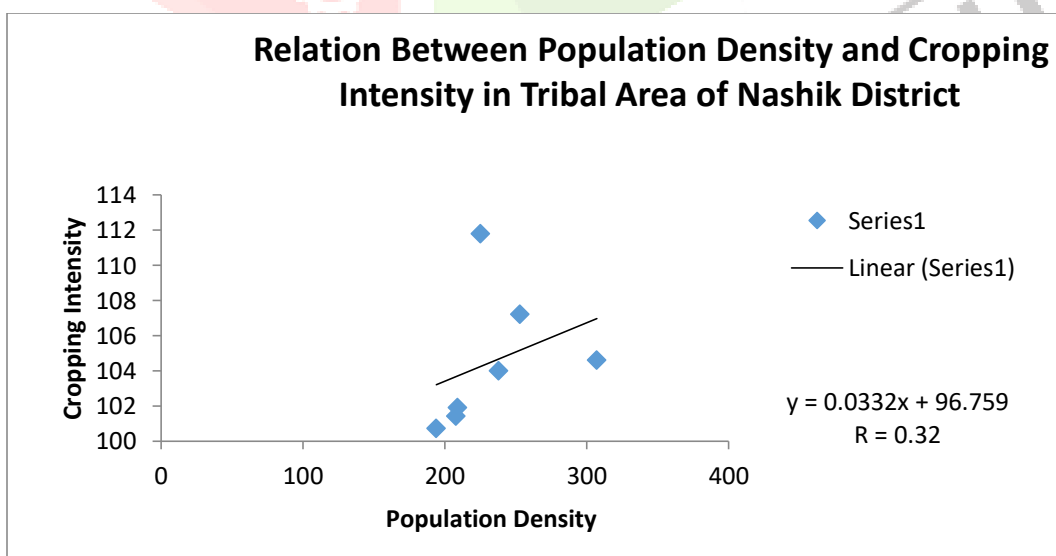


Fig 1.1

The correlation between the percentage of literacy and the intensity of cropping found negative relationship - 0.35 as shown in figure 7.4 it is observed that the tribal area traditional cultivation is to be practiced.

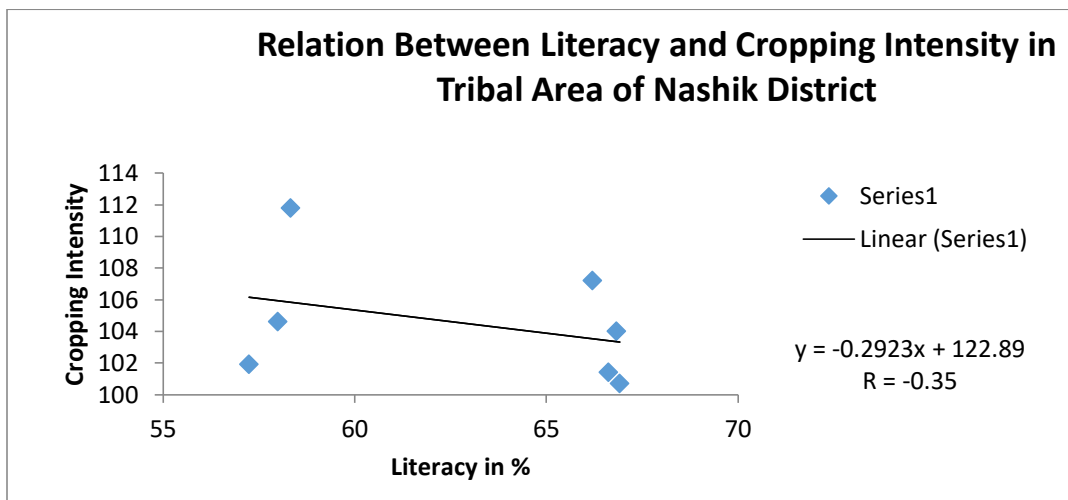


Fig 1.2

The relationship between area under irrigation and the intensity of cropping found to be positive correlation 0.76 as shown in figure 7.5. But the analysis is not significant because some tehsil having high intensity of irrigation and some parts of the study area having low intensity of irrigation. Though here the relationship is calculated considering the average value of irrigation and intensity of cropping in the tribal tehsil if it is calculated at village level the negative relationship would be found.

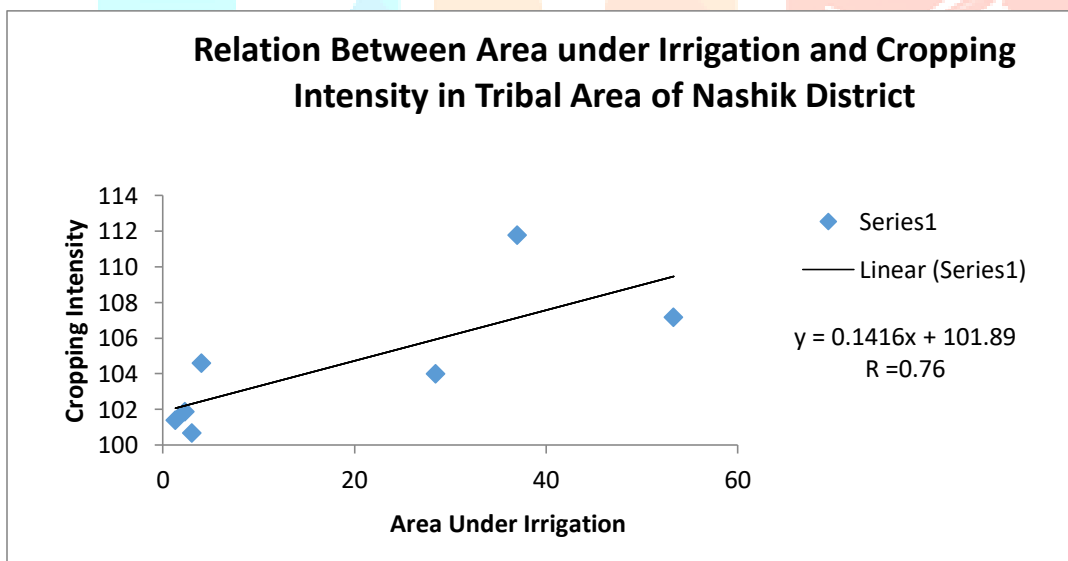


Fig 1.3

The area under cash crops and intensity of cropping found to be positive correlation $r=0.74$ as shown in figure. But the analysis is not significant here the relationship is calculated considering the average value of crops. But if it is calculated at village level the negative relationship would be found.

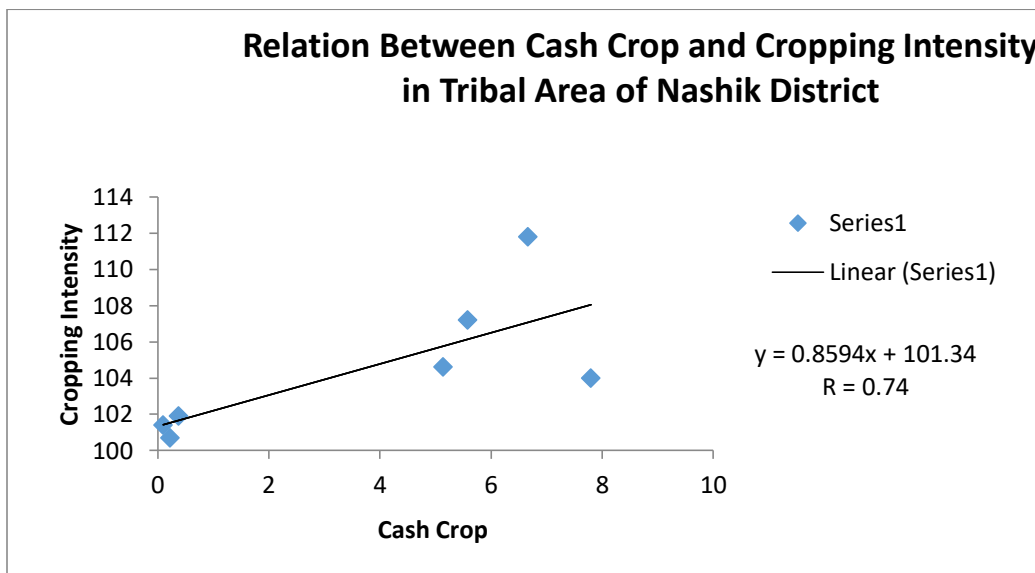


Fig 1.4

1.6 Levels of Agricultural development in tribal areas of Nashik District

Nashik district generally speaking tribal agricultural has been of the subsistence type related to uneven topography, poor soil conditions, low investment capacity, low level of technology, non-availability of inputs, ill developed infrastructure, inadequate marketing facilities etc. The level of development influenced by various aspects such as physical, socio-economic, technological and organizational factors. In order to describe the spatial pattern of agricultural development in tribal composite Z scores and principal component analysis method used for level of development. The Z score is obtained by the following formula using 14 variables Z score is calculated for the analysis.

$$Z = \frac{X - \bar{X}}{SD}$$

Where x is the individual row score on a given variable \bar{x} is the Mean and Standard deviation of all data.

1. Percent of rice to total cropped area X_1
2. Percent of cash crops to total cropped area X_2
3. Percentage of horticultural crops to total cropped area X_3
4. Intensity of cropping X_4
5. Percentage of agricultural workers to total workers X_5
6. Percentage of literacy to total population X_6
7. Percentage area under fertilizers to total cropped area X_7
8. Percentage of area under irrigation to total cropped area X_8
9. Percentage of Iron plough to total tribal area X_9
10. Percentage of tractor to total tribal area X_{10}

11. Crop Diversification index X_{11}
12. Agricultural productivity index ranks (Kendall Method) X_{12}
13. Percentage of Net sown area to total geographical area X_{13}
14. Percentage of Fallow land area to total geographical area X_{14}

The data matrix for the calculation of Z scores of spatial variation in agricultural development of the tribal area in Nashik district is given on table 1.3 After processing the data, some Negative and Positive Z scores under individual variable columns are summed up, resulting some composite index (CI) values, from these composite

1. High Agricultural Development area:-

Dindori and Baglan these two tehsils areas of high agricultural development in the study area, most of the people of these two tehsils are tribal and non-tribal social group. The net sown area accounts for 49.13 and 53.84 percent of the total area of Dindori and Baglan respectively in 2010-11. The degree of double and multiple cropping in the net sown area is also higher, the indices of cropping intensity being 111.8 and 107. Fruits and Vegetables are cultivated in these two developed tehsils; the production of fruits and vegetables is the highest due to irrigation, soil fertility and attitude of farmers. The farmers of these two tehsils are more skillful they use HYV seeds, fertilizers, pesticides and insecticide and other modern agricultural inputs, hence the increase the production of crops in agricultural lands. In these two tehsils farmers use tractor, spray machine, iron plough and other implements are highest.

2. Medium Agricultural Development area

Kalvan is only one medium development tribal tehsil of the district. The net sown area of Kalvan tehsil is 108.1 percent of the total geographical area in 1991. It is increased to 114 percent in 2001. But 2010-11 it is decreased to 104 percent. The intensity of cropping is medium. In this tribal tehsil high diversification of crops in western part and concentration of one or two major crops in eastern plain part, positive factors in Kalvan tehsil are irrigation and fertile soils in Girna basin dominating sugarcane cultivation shows least diversification of crops.

3.Low Agricultural Development Area

Peint, Surgana, Igatpuri these three tribal tehsils are identified as the areas of low agricultural development in the district. The percentage of net sown area above 100 of the total geographical area in 2010-11, the intensity of cropping is low. The farmers in these areas are traditionally growing food grains at the subsistence level. Large areas in barren land, small size of land holding indicate the negative effects of relief.

1.6 Conclusion

The Present study reveals that the spatial distribution of variables and agricultural development is not uniform in tribal areas of Nashik district as well as socio-economic and physical factors are responsible for disparity in agricultural productivity. The levels of agricultural development is found higher in Dindori and Baglan tehsils only. The farmers of these two tehsils are more skillful they use HYV Seeds, fertilizer, pesticides, and other modern agricultural inputs. Rest of the tehsils low level of development because of geographical location, lack of Infrastructure development and low use of modern technological inputs. From the foregoing results it is clear that cropping intensity has increased with the use of modern agricultural inputs. It is also reflected for the forty years of period's i.e.1981 to 2020-21.

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