



## Geographical Study Of Changing Crop Diversification in Piedmont Area Of Jalgaon District

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### ABSTRACT

*Agriculture is an art of raising plant life from the soil for the use of mankind. Agriculture is the mile stone in the history of human civilization, due to agriculture man settled at particular place. Agriculture is one of the oldest and prime activities of the human being. Crop diversification gives a wider choice for production of variety of crops in any region in order increase production related activities. It is just opposite of crop Specialization Crop diversification is generally viewed as a shift from traditionally grown less remunerative crops to more remunerative crops. The crop diversification takes place due to governmental policies and crop selection and attitude of farmers. Market, infrastructural development and certain other price related supports also induce crop diversification. Crop diversification indicates multiplication of agricultural crops which involves intense competition for region, scope for crop rotation and effect of double cropping. The crop diversification was studied for twenty years (1996-97 to 2016-17) in order to find out crop diversification.*

**KEYWORDS:** *Crop diversification, Index of crop Diversification, variation in resources, circle, Agricultures.*

### INTRODUCTION:-

Crop diversification is an indicator of multiplication of agricultural activities which obviously involve intense competition among various activities for space (Jasbir Singh, 2004), It is an important concept in agricultural land use. The nature of crop diversification differs from region to region and it is due to existence of wide homogeneity in agro climatic regions. The pattern of crop diversity is also changed at micro level.

Crop diversification is a concept which is opposite to crop specialization. The farmers all over the world, especially in the 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, socio-economic conditions and technological development in a region. In general, higher the level of agricultural technology, lesser the degree of diversification. Moreover, the rich farmers prefer to specialize in agricultural enterprise while the poor and sub-settle farmers are generally more interested in the diversification of crops.

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The higher profitability and production the stability induce crop diversification, in case of example, sugarcane replacing rice and wheat. Crop diversification grows on large number of crops which are practiced in rain fed land to reduce the risk factor of crop failures either of drought or less rain. Raising a variety of crops on arable land is known as crop diversification. is the reflection of physical, socio economic and techno organization inputs. Crop diversification indicates multiplication of agricultural crops which involves intense completion for region, scope for crop rotation and effect of double cropping.

Many geographers and economists so far have applied the concept of diversification in variety of sense. This concept, initially, was applied in the field of manufacturing to identify the degree of diversifications and concentrations by Cleann (1930), later on, by Tree (1938), Florence (1942) and

Rainwald (1949).Gibb Martin (1974) has used diversification concept in computing measurement of diversification of employment in industry. Among geographers, Bhatia (1965) adopted and introduced crop diversification technique in order to understand crop competition in the region followed by Jasbir Singh (1976); Ayyer (1969) modified Bhatia's method of crop diversification with accounting for those crops which occupy at least one per cent of the gross cropped area.

**OBJECTIVE:-**

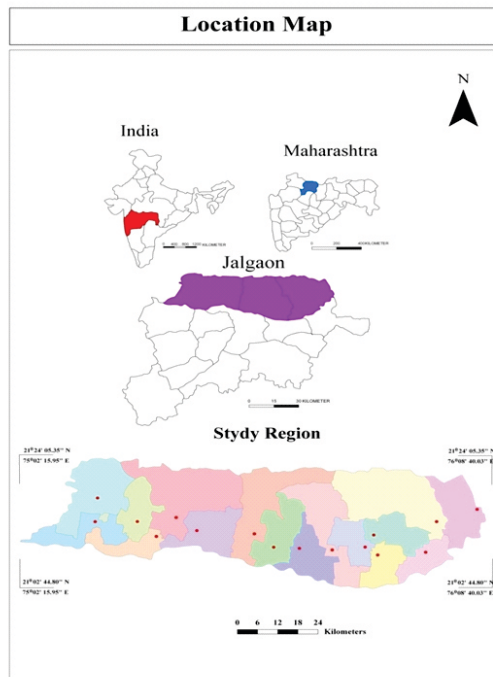
- i) To comparative study of circle-based changes in Crop diversification of study region.
- ii) To find out the distributional pattern of Crop diversification.
- iii) To study the factors affecting on Crop diversification.

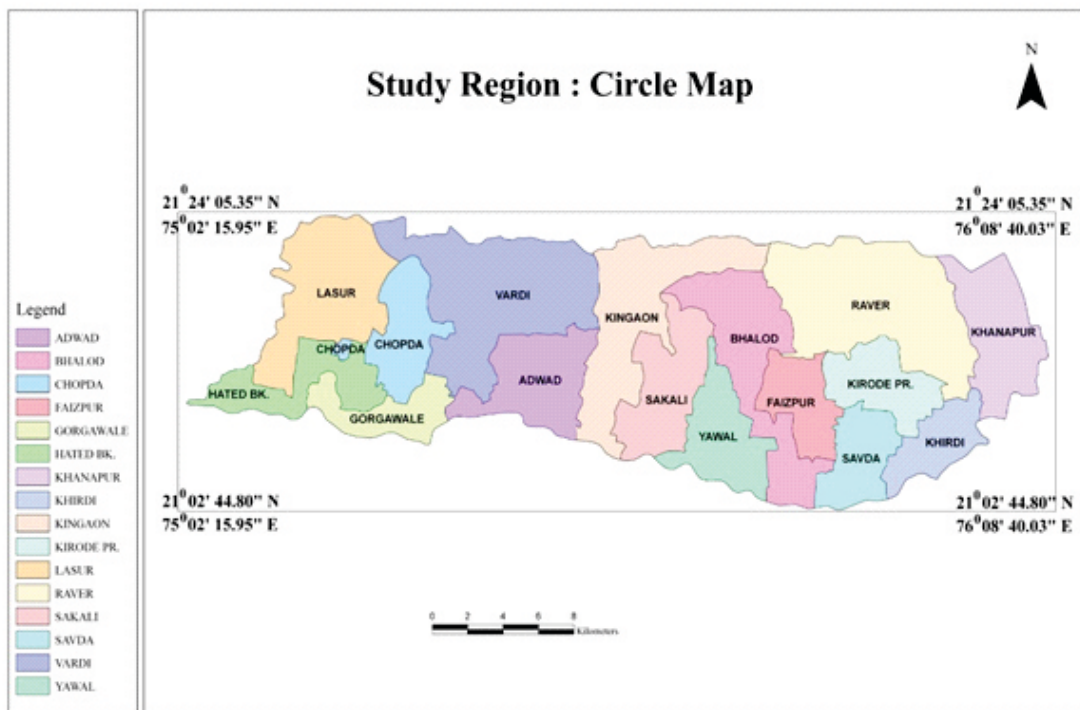
**HYPOTHESIS**

In the field of study, the effects of natural, social and economic factors affect the crop selection of farmers and changes in crop diversification.

**STUDY AREA:**

Geographically the area of study is at the foot of the Satpuda Mountains. It extends between 21°02'44" to 21°24'05" N latitude and 75°02'15" to 76°08'41" East longitude. To the north part of the Satpuda mountain region and beyond it is the state of Madhya Pradesh. The north-eastern states are Barhanpur district, against Muktainagar tahsil, Bhusawal, Jalgaon, Dharangaon and Amalner tahsil on the south and Dhule district on the west. The southern boundary of the study area is determined by the Tapi River and the western boundary is by the Aner River. In the field of study, Tapi is the main river and its tributaries are Ratnavati, More, Suki, Abhora. The climate of the study area is warm and dry. Average minimum temperature between 8° C to 12° C and maximum temperature is 42° C. sometimes max. temperature increases near about 48° C. Rainfall of the region between 760mm to 810mm. Some places in the Satpuda mountain range are more than 750 meters high. Medium Black soil, Black Alluvial Clay soil and Alluvial soils are found in the plains of Tapi in the study area, while sandy and mountain soils are found directly at the foot of Satpuda Ranges in the north.





The data this collected though primary and secondary sources, Secondary data obtained from Form no.20-8A from Circle Office, Socio-economic review, District Census Handbook and Village Directory, were processed by statistical methods and presented by cartographic techniques (Choropleth Map) with the help of ILWIS Software. researcher studied spatial changes in area under Crop diversification in piedmont area of Jalgaon district from 1996-97 to 2016-17. The circle has been taken as unit of study. In the present study few crops have been taken into consideration such as Wheat, Maize, Bajara, Jowar, Pulses, Oilseeds, Sugarcane, Cotton and Others crops. These crops occupy more than 90 per cent of the total cropped area of the circle.

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

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

Where x crops are those crops that individually occupy 05 per cent or more of the gross cropped area in the area under study.

### Discussion

The degree of crop diversification is closely influenced by the soil characteristics, soil moisture, amount of rainfall received, the availability of irrigation facilities, the accessibility of the Arable land and the technology deployed by the cultivators. As stated earlier, the areas of extreme wet or extreme dry climate are least conducive for crop diversification.

Table no.1.1

Study Regions:Pattern of Crop Diversification  
(1996-97 to 2016-17)

Sr. No.	Circle	Index of Crop Diversification		
		1996-97	2006-07	2016-17
1	Lasur	14.40	16.95	20.97
2	Vardi	16.39	12.32	11.06
3	Chopda	15.54	14.95	12.15
4	Hated	13.31	10.81	18.28
5	Gorgaonle	10.66	12.25	12.78
6	Adavad	15.85	14.89	16.66
7	Kingaon	12.95	12.53	15.27
8	Sakali	14.81	19.67	16.41
9	Yawal	14.47	20.10	13.25
10	Bhalod	13.08	15.09	13.49
11	Faijpur	15.34	17.66	16.04
12	Raver	17.30	17.70	16.92
13	Khanapur	22.02	22.37	21.77
14	Khiroda	17.11	15.89	22.48
15	Savda	16.98	17.07	12.62
16	Khirdi	21.86	22.15	18.62

Source: Prepared by Author

Table no.1.1 clearly shows that the Pattern of Crop Diversification of 1996 - 97 to 2016-17 in Piedmont area of Jalgaon district portrays the spatial distributional pattern of crop diversification in the study regions.

In 1996-97 maximum index of crop diversification appears in Khanapur (22.02) circle and lowest at Gorgaonle (10.66) circle while in 14 circles the crop diversification was from 12.95 to 21.86.

According to 2006-07 maximum index of crop diversification appears similarly in Khanapur (22.37) circle and lowest at Hated (10.81) circle. In 2016-17 maximum index of crop diversification appears in Khiroda (22.48) circle and minimum at Vardi (11.06) circle while in 14 circles the crop diversification was from 12.15 to 21.77.

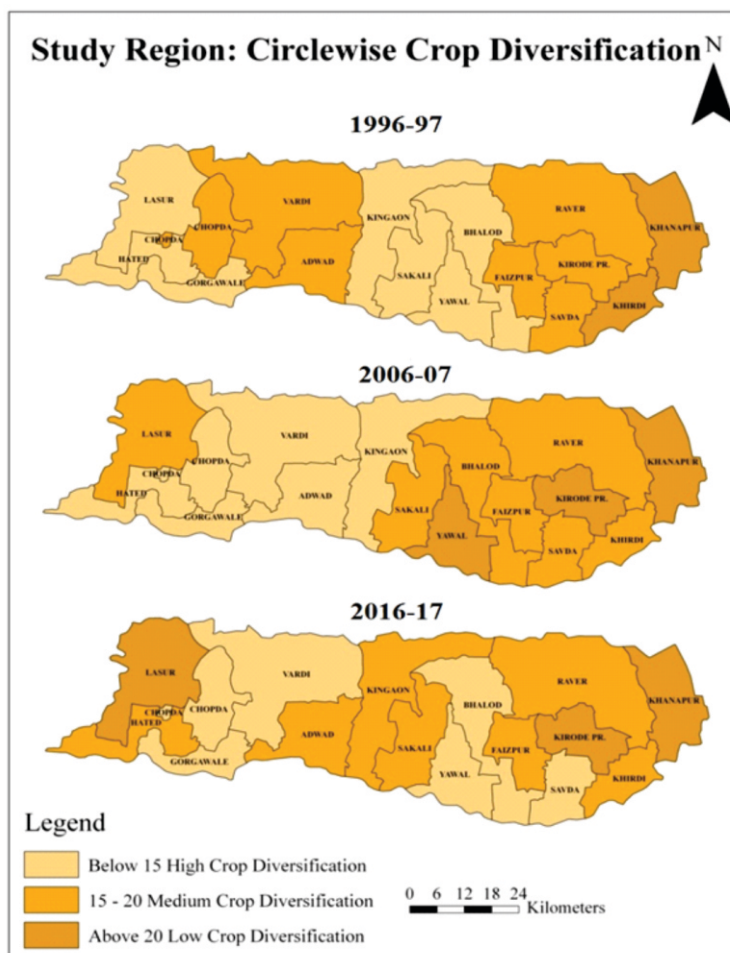
Table no. 1.2 shows that study area is divided into three indexes of crop diversification regions-

1. Area of high crop diversification
2. Area of moderate crop diversification
3. Area of low crop diversification.

Table No. 1.2  
Study Regions: Indexes of crop diversification

Category	Index	1996-97	2006-07	2016-17
High	Below 15	Lasur, Hated, Gorgaole, Kingaon, Sakali, Yawal, Bhalod	Vardi, Chopda, Adavad, Hated, Gorgaole, Kingaon	Vardi, Chopda, Gorgaole, Yawal, Bhlod
Moderate	15 to 20	Vardi, Chopda, Adavad, Faijpur, Raver, Khiroda, Savda	Lasur, Sakali, Bhalod, Faijpur, Raver, Khiroda, Savda	Hated, Adavad, Kingaon, Sakali, Faijpur, Raver, Khirdi
Low	20 to Above	Khanapur, Khirdi	Yawal, Khanapur, Khirdi	Lasur, Khanapur, Khiroda

Source: Prepared by Author



### **1. Area of high index of crop diversification**

This category of index of crop diversification ranges below 15 in 1996-97 to 2016-17. In 1996-97 seven circles come high index of crop diversification. The crops in diversification are Jowar, Bajara, Cotton, Pulses, Sugarcane, Banana, Other Miscellaneous Crops, Tur, Maize in Lasur (14.40), Hated (13.31) circles, Jowar, Bajara, Cotton, Pulses, Bajara, Banana and Maize crop found in Gorgaonle (10.66), Kingaon (12.95) circle, where Jowar, Bajara Sugarcane, Pulses, Grass Grain, Tur and Cotton, Banana crop recorded in Sakali (14.81), Yawal (14.47) and Bhalod (13.08) circle. The area of high index crop diversification appears consisted of the Circles of Lasur on the northwest of the study area, Hated on the southwest, Gorgaonle, Kingaon, Sakali, Yawal and Bhalod in the central region.

In 2006-07 six circles come high index of crop diversification. The crops in diversification are Jowar, Bajara, Cotton, Pulses, Sugarcane, Banana, Other Miscellaneous Crops, Tur, Maize in Vardi (12.32), Chopda (14.95) circles, Jowar, Bajara, Cotton, Pulses, Bajara, Banana, Grass Grain and Maize crop found in Adavad, (14.89), Hated (10.81) circle, where Jowar, Bajara Sugarcane, Pulses, Grass Grain, Tur and Cotton, Banana crop recorded in Gorgaonle (12.25) and Kingaon (12.53) circle. According to 2016-17 five circles come under high index of crop diversification. Vardi, Chopda, Gorgaole, Yawal, Bhalod The crops in diversification are Jowar, Banana, Pulses, Maize, Tur and Cotton crops in Vardi (11.06) and Chopda (12.15) circle, Jowar, Grass Grain, Sugarcane, Cotton, Pulses, Banana and Tur crop found in Gorgaonle (12.78) and Yawal (13.25) circle, Cotton, Jowar, Grass Grain, Pulses Tur and Maize crops in Bhalod (13.49) tahsil, The area of high index crop diversification appears in western and south part of the district. The western and southern part in the district identified below 15 index of crop diversification on Black Alluvial Clay soil tract and average annual rainfall in the circles.

### **2. Area of Moderate Index Crop Diversification**

This category 1996-97 seven circles come moderate index of crop diversification. The crops in diversification are Jowar, Bajara, Grass Grain, Maize, Tur Cotton, Banana, Sugarcane and Other Miscellaneous Crops in Vardi (16.39), Chopda (15.54) and Adavad (15.85) circles, where Cotton, Jowar Grass Grain, Pulses and Tur crop recorded in Faijpur (15.34), Raver (17.30), Khiroda (17.11) and Savda (16.98) circle. The area of moderate index crop diversification appears in Southern, Western and Central part of the district.

2006-07 seven circles come moderate index of crop diversification. The crops in diversification are Jowar, Bajara, Grass Grain, Cotton, Pulses, Sugarcane, Banana, Other Miscellaneous Crops, Tur, Maize in Lasur (16.95), Sakali (19.67) circles, Jowar, Bajara, Cotton, Pulses, Bajara, Banana, Grass Grain and Maize crop found in Bhalod (15.09), Faijpur (17.66) circle, where Jowar, Bajara Sugarcane, Pulses, Grass Grain, Tur and Cotton, Banana crop recorded in Raver (17.70), Khiroda (15.89) and Savda (17.07) circle.

According to 2016-17 seven circles come moderate index of crop diversification. The crops in diversification are Jowar, Bajara, Grass Grain, Cotton, Pulses, Sugarcane, Banana, Crops, Tur, Maize in Hated (18.28), Adavad (16.66) circles, Jowar, Cotton, Pulses, Bajara, Banana, Grass Grain and Maize crop found in Kingaon (15.27), Sakali (16.41) circle, where Jowar, Sugarcane, Pulses, Grass Grain, Tur and Cotton, Banana crop recorded in Faijpur (16.04), Raver (16.92) and Khirdi (18.62) circle. The area of moderate index crop diversification appears in Northern and south part of the region. The northern and southern part in the district identified 15 to 20 index of crop diversification on Black Cotton soil tract average annual rainfall in the circle.

### **3. Area of Low Index Crop Diversification**

This category 1996-97 two circles come low index of crop diversification. The crops in diversification are Jowar, Bajara, Grass Grain, Maize, Tur Cotton, Banana, Sugarcane and Other



Miscellaneous Crops in Khanapur, (22.02), Khirdi (21.86) circles

2006-07 three circles comes moderate index of crop diversification. The crops in diversification are Jowar, Bajara, Grass Grain, Cotton, Pulses, Sugarcane, Banana, Crops, Tur, Maize in Yawal, (20.10), Khanapur (22.37) and Khirdi (22.15) circles,

According to 2016-17 three circles comes moderate index of crop diversification. The crops in diversification are Jowar, Bajara, Grass Grain, Cotton, Pulses, Sugarcane, Banana, Crops, Tur, Maize in Lasur, (20.97), Khanapur,(21.77) and Khiroda(22.48) circle. The northern and southern part in the district identified 20 to above index of crop diversification on the circle

In the areas where the variability of rainfall is high and adequate sources of irrigation are available, farmers grow only Cash crops in a season. Due to the problems of farm laborers that have arisen in the recent past, farmers prefer single and even cash crops. Diversification has usually been done by the farmers to enhance nitrogen in the soil and to replenish the soil fertility. It has been established by the agricultural scientists that crop specialization and monoculture for several years lead to soil degradation. In other words crop diversification increases the sustainability of arable land.

#### **CONCLUSION:-**

The Piedmont region agriculture is gradually diversifying to high value food commodities. The contribution of crop diversification to agricultural growth is significant. The study has revealed that, crop diversification is the ultimate solution to many problems. It must be viewed as all opportunity particularly in rain fed areas, which were rather by passed the green revolution phase natural resources. can be used as effective measures to elevate rural poverty and general rural employment and conserve Therefore, farmers in this area should be guided and trained for the advanced method of irrigation etc. It Is suggested that, farmers in these circles should use drip irrigation. Overdoses of chemical fertilizers are responsible for soil do

1. Lasur, Hated, Gorgaonle, Adavad, Kingaon, Sakali, Bhalod, Faijpur and Khiroda have increased crop diversity.
2. The crop varieties are reduced due to the increase of crop area of cotton, wheat and Oilseed crop in the circle of Vardi, Chopda, Yawal, Raver, Khanapur, Sawada and Khirdi.
3. Due to the problems of farm laborers that have arisen in the recent past, farmers prefer single and even cash crops.
4. The combination of social and economic factors and market price has been shown to have an impact on crop diversity.
5. Impact of natural factors such as soil, climate, availability of water irrigation on crop diversification.
6. The cropping pattern in the realm is concentrated due to cash crops.

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