

**RESEARCH ARTICLE :**

## Changes in cropping pattern and crop diversification in Yawatmal district

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**SUMMARY :** The research entitled “Changes in cropping pattern and Crop diversification in Yawatmal district” was carried with objective to study the changes in cropping pattern and extent of crop diversification in Yawatmal district. The present study was based on secondary data collected from different government publications. The data covered a period of 20 years *i.e.*, 1988-89 to 2008-09. In all 8 crops were considered for study. These crops covered more than 85 per cent of the total cropped area for the study area of 4 tahsils *i.e.*, Ghatanji, Digras, Darwha and Ner. The names of selected crops were Cotton, Soybean, Mung, Tur, *Kharif* Jowar, Wheat, Udid and Gram, for base year 1988 – 89. Simple tabular analysis was used to examine the changes in cropping pattern in various tahsils of Yawatmal district. In order to study the extent of crop diversification Herfindahl index has been used. Tahsilwise analysis showed that the area under *Kharif* jowar has found to be decreased in all the tahsils of Yawatmal district. Area under tur crop was decreased in Darwha and Ner tahsil. The area under mung has found to be decreased in all the tahsils. Cotton still remains as major crop of the district. In majority of tahsils Yawatmal district *i.e.*, Ghatanji, Digras, Darwha and Ner crop diversification has significantly increased during the study period. The diversification from subsistence crop to more commercial crops were took place in selected tahsils.

**KEY WORDS :**

Cropping pattern,  
Crop diversification,  
Herfindahl index

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### **BACKGROUND AND OBJECTIVES**

The study of cropping pattern assumes a great significance as it is one of the important path for balanced development of agriculture to meet the human requirements. The adoption of better cropping pattern optimally suited to the technological changes is an important one for augmenting agricultural growth. Cropping pattern of a particular area either state region, districts etc. emerges

through the interaction of physical, social, economic, technological and infrastructural factors.

Diversification of agriculture is becoming important as farmers as faced with flowing restrictions of market imbalances between supply and demand for their products and farmers must be aware of market trends before he hope to diversify. Crop diversification is defined as diverting of

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sizeable areas from the existing cropping pattern to other crops and enterprises to meet the ever increasing demand for food, fodder, fibre and other needs. It can also be defined as producing increased variety of agricultural commodities.

Diversification becomes necessary since cereals cannot alone support economic development not withstanding the need to ensure food security. Diversification to commercial crops can increase income and minimize risk and earn foreign exchange. Diversification increased individual and social gains, helps in poverty alleviation, employment and environmental conservation. In the context of Indian agriculture, diversification has occurred across and with crops, livestock, and horticultural sectors. Technological changes and government policies accelerate diversification to avoid mono cropping.

## RESOURCES AND METHODS

### Analysis of changes in cropping pattern :

Cropping pattern of various tahsils of Yavatmal district of Vidarbha region has been studied in detail by tabular analysis for all the selected crops. Cropping pattern in terms of percentage share of individual crops in gross cropped area has been worked out at five points of time. The points at which analysis of cropping pattern has been done are 1988-89, 1992-93, 1997-98, 2002-03, 2008-09.

### Analysis of extent of crop diversification :

In order to quantify extent of crop diversification Herfindahl indices have been computed at different points of time.

### Herfindahl index :

The index was computed by taking the sum of squares of area proportion of each crop in the total cropped area. Mathematically the index was calculated as:

$$\text{Herfindahl index} = \sum_{i=1}^N P_i^2$$

where,

N = Total number of crops

P<sub>i</sub> = Proportion of area under i<sup>th</sup> crop to total cropped area

The value of HI is equal to zero indicates perfect diversification and one complete specialization in the

cropping pattern. Thus the Herfindahl index is bounded by zero and one and it is a measure of concentration.

## OBSERVATIONS AND ANALYSIS

The results obtained from the present study as well as discussions have been summarized under following heads :

### Changes in cropping pattern :

The cropping pattern of a particular region emerges and also changes through the interaction of physical, social, economic, technological and infrastructural factors. The decisions of a farmer regarding cropping pattern are based on monetary returns, availability of production technologies, accessibility of resources and many others. During last two decades, considerable changes has been occurred in the agricultural scenario. These changes have results into a drastic changes in the cropping pattern of the region. So it is essential to examine the magnitude and direction of changes in the cropping pattern over three decades.

The changes in cropping pattern have been examined for four tahsils of Yavatmal district of Vidarbha region *i.e.*, Ghatanji, Digras, Darwha and Ner. The changes in the cropping pattern were estimated for the period 1988-89 to 2008-09. The area under selected crops and the relative share of each crop in the gross cropped area at different points of time have been used to study the changes in cropping pattern.

### Changes in cropping pattern in Yavatmal district :

The changes in the cropping pattern in Yavatmal district was workout and presented in Table 1.

From the table 1, it is observed that cotton, soybean and *Kharif* jowar were major crops of the district. The proportion of area under cotton was 45.83 per cent in 1988-89 which decreased to 44.03 per cent in 2008-09. The per cent change over base year was 2.41 per cent. However drastically change in area of mung (3.47 % to 0.99 %), *Kharif* jowar (29.70 % to 12.44 %), udid (2.10 % to 1.06 %) and gram (1.54 % to 0.85 %) was observed in study period. The proportion of *Kharif* jowar was 29.70 per cent in the year 1988-89 has reduced to 12.44 per cent in 2008-09. The proportion of area under cotton crop was 45.83 per cent in 1988-89 and in the year 2008-09 it was 44.03 per cent, indicated that slightly decrease in area of cotton. The proportion of area under cotton was

highest in 1997-98 *i.e.*, 54.89 per cent. The percentage of area under soybean crop was to the extent of 18.95 per cent which is excellent diversified crop of the district. The area under mung and gram shows decreasing proportion *i.e.*, 3.47 to 0.99 per cent and 1.54 to 0.85 per cent respectively. No more significant changes in gross cropped area were observed in the period of study.

From the above table it also showed that mung crop has shown the most replaced crop which has been decreased to 70.89 per cent to the base period may be because it is a subsistence crop to the farmers. It is also shown that In the Yavatmal district that cotton crop cover the consistent area which is somehow in decreasing *i.e.*, 2.41 per cent over the base period 1988-89 to 2008-09 which revealed that it is still the major crop of the district which is used mainly as a cash crop to the farmers.

#### Extent of crop diversification :

The analysis of changes in cropping pattern indicates that diversification took place in selected tahsils of Yavatmal district. The level of crop diversification varies in selected tahsils of Yavatmal district because of varied agro-climatic conditions and resource endowment of the farms. Hence, an attempt was made to examine the level of crop diversification in selected tahsils of Yavatmal district at different points of time.

Crop diversification indices *i.e.*, Herfindahl index was used to measure the level of crop diversification in present study.

#### Measurement of crop diversification: Herfindahl index :

Herfindahl index is also a measure of concentration. The value of Herfindahl index varies from zero to one. It takes the value one when there is complete specialization and value zero when there is perfect diversification.

The Table 2 revealed that the value of Herfindahl index in Ghatanji, Digras, Darwha, and Ner tahsils of Yavatmal district were found low *i.e.*, less than 0.5, it means in all the selected tahsils, diversification took place. The diversification from subsistence crop to more commercial crops were took place in these tahsils.

#### Conclusion :

The area under Cotton, *Kharif* Jowar, Tur, Green gram and Soybean are the major crops of Yavatmal district. Area under *Kharif* Jowar has reduced in all tahsils of Yavatmal district. Soybean is a emerging crop and attaining prestigious position in cropping pattern in different tahsils of Yavatmal district. Area under gram

Crops	Years					Per cent change over base year <i>i.e.</i> , 1988-89
	1988-89	1992-93	1997-98	2002-03	2008-09	
Cotton	396279 (45.83)	402208 (42.20)	449341 (54.89)	403327 (43.74)	386736 (44.03)	-2.41
Soybean	-	-	-	80722 (8.75)	166421 (18.95)	-
Mung	29987 (3.47)	59252 (6.22)	20154 (2.46)	51580 (5.59)	8730 (0.99)	-70.89
Tur	68118 (7.88)	101545 (10.65)	54319 (6.64)	127292 (13.80)	60576 (6.90)	-11.07
<i>Kharif</i> Jowar	256864 (29.70)	231415 (24.28)	217273 (26.54)	139396 (15.12)	109275 (12.44)	-57.46
Wheat	18052 (2.09)	15391 (1.61)	2538 (0.31)	17605 (1.91)	16024 (1.82)	-11.23
Udid	18128 (2.10)	19182 (2.01)	13572 (1.66)	26379 (2.86)	9345 (1.06)	-48.45
Gram	13358 (1.54)	10945 (1.15)	1864 (0.23)	16792 (1.82)	7472 (0.85)	-44.06
Other crops	63968 (7.40)	113258 (11.88)	59540 (7.27)	59011 (6.40)	113708 (12.95)	77.76
Gross cropped area	864754 (100.00)	953196 (100.00)	818601 (100.00)	922104 (100.00)	878287 (100.00)	1.56

Figures in the parentheses are percentages to the gross cropped area.

Year	Ghatanji	Digras	Darwha	Ner	Yavatmal
1988-89	0.37	0.31	0.29	0.33	0.31
1992-93	0.31	0.21	0.29	0.33	0.27
1997-98	0.37	0.37	0.38	0.40	0.38
2002-03	0.27	0.21	0.25	0.29	0.25
2008-09	0.30	0.26	0.28	0.23	0.27

has decreased in all tahsils of Yavatmal district. Crop diversification has increased in Yavatmal district. Digras tahsil shows low level of diversification. Ghatanji, Darwha, Ner tahsils shows high level of diversification. Jowar and soybean are adventitious crops over other crops in Ghatanji tahsil.

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