Original Research Article

Crop Diversification in Selected Tahsils of Amravati District- Microlevel Analysis

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A B S T R A C T

The paper has examined trends and patterns of crop diversification in selected tahsils of Amravati district. The present study based on secondary data collected from various government publications and pertains to a period of 13 years i.e. from 2003-04 to 2015-16. In order to study the crop diversification Herfindahl index and Entropy index have been used. The diversification from subsistence crop to more commercial crops were took place in selected tahsils of Amravati district. In Dharni tahsil, the most stable crop was Soybean followed by Cotton and Tur. In Chikhaldara tahsil, most stable crop was *Kharif* jowar followed by soybean. In Bhatkuli tahsil, most stable crop is Soybean followed by other crop and Tur. In Nandgaon tahsil, Soybean was most stable crop followed by Cotton and *Kharif* jowar and in Tiwasa tahsil Soybean was most stable crop followed by Cotton and Black gram.

Introduction

Crop diversification is a concept opposite to crop specialization, providing the relative area strength between crops grown in a region. It is an agricultural technique where farmers harvest a variety of crops instead of just one. Crop diversification in India is generally viewed as a shift from traditionally grown less remunerative crops to more remunerative crops. It is intended to give a wider choice in the production of a variety of crops in a given area so as to expand production related activities on various crops and also to lessen risk. Crop diversification patterns have great relevance in the agricultural land use studies, and are an important component of the crop geography of a region. It reduces risk factor resulting from crop failure within a region. Though rich farmers prefer specialization, the poor and substitute farmers are interested in diversification of crops. Diversified crops tend

to be more pest-resistant. Diversification enhances nitrogen in the soil to replenish the soil fertility. Thus, it increases the sustainability of arable land. It generates more employment as the agricultural workers remain busy in sowing, weeding, harvesting and marketing of crops throughout the year. Increase in intensity of cultivation and in yields per unit area are the only available options to meet future food needs to feed an ever increasing population.

Farmers and their families benefit from greater variety in their diets, and therefore better nutrition.

Materials and Methods

Quantification of crop diversification

Crop diversification Index is indicator for observing and quantifying cropping pattern changes. In order to quantify extent of diversification Herfindahl and Entropy Index will be computed at different points of time.

Herfindahl index

The Index will be computed by taking the sum of squares of area proportion of each crop in the total cropped area. Mathematically the Index expressed as fallow

$$\text{Herfindahl Index (H.I.)} = \sum_{i=1}^{N} Pi^2$$

Where
N = Total no. of crops.
P_i= Proportion of area under i[th] 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.

Entropy Index

Entropy index is regarded as an inverse measure of concentration having logarithmic character.

$$(E.I) = \sum_{i=1}^{n} P i^2 \log \frac{1}{Pi}$$

An index close to zero indicates the concentration towards a few crops if it is near to one it indicates complete diversification.

Results and Discussion

The analysis of changes in cropping pattern indicates that diversification took place in selected tahsils of Amravati district. The level of crop diversification varies in selected tahsils of Amravati 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 Amravati district at different points of time. Crop diversification indices i.e. Herfindahl index and Entropy index was used to measure the level of crop diversification in present study.

Measurement of crop diversification by 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. It revealed from Table.1 are the values of Herfindahl index in Dharni, Chikhaldara, Bhatkuli, Nandgaon, and Tiwasa tahsils of Amravati district were found varied from 0.19(corresponding to Chikhaldara and Nandgaon tahsil during the year 2003-04) and 0.47 (corresponding to Bhatkuli tahsil during the year 2015-16). Which denotes high degree of diversification took place in selected tahsils of Amravati district.

Table.1. Measurement of crop diversification : Herfindahl Index

Years	Dharni	Chikhaldara	Bhatkuli	Nandgaon	Tiwasa
2003-04	0.22	0.19	0.20	0.23	0.21
2006-07	0.29	0.23	0.35	0.19	0.26
2009-10	0.30	0.35	0.37	0.20	0.27
2012-13	0.27	0.37	0.38	0.22	0.29
2015-16	0.30	0.45	0.47	0.30	0.33

Table.2. Measurement of crop diversification: Entropy index

Years	Dharni	Chikhaldara	Bhatkuli	Nandgaon	Tiwasa
2003-04	0.74	0.83	0.76	0.70	0.75
2006-07	0.68	0.71	0.63	0.79	0.70
2009-10	0.66	0.57	0.61	0.75	0.69
2012-13	0.66	0.53	0.58	0.74	0.66
2015-16	0.61	0.72	0.75	0.62	0.58

Measurement of crop diversification: Entropy index

It revealed from Table.2 Entropy index of Dharni, Chikhaldara, Bhatkuli, Nandgaon and Tiwasa tahsils ofAmravati district. Entropy index is also a measure of concentration. The value of Entropy index varies from zero to one. It takes the value one there is perfect diversification and value zero when there is complete specialization.

From the Table.2 it is revealed that in all the selected tahsils of Amravati districts whole the value of Entropy index were more than ranges between 0.5-0.3 i.e.0.83 (corresponding to Chikhaldara tahsil during the year 2003-04) and 0.58 which denote high degree of tahsil i.e.36.45 per cent, 53.00 per cent and

diversification took place in selected tahsils of Amravati district.

Highest variability for area under *Kharif* Jowar was observed in Chikhaldara 72.49 per cent followed by Bhatkuli 48.57 per cent and Dharni 41.18 per cent. In respect of Cotton highest variability in area was observed in Bhatkuli 34.31 per cent followed by Tiwasa 12.57 per cent.

In the area of Soybean crop highest variability in area was observed in Dharni 70.75 per cent followed by Nandgaon 67.49 per cent and Tiwasa 47.29 per cent.

Highest variability in area of Tur, Green gram and Black gram was observed in Chikhaldara 53.80 per cent. Over a period of time

diversification was observed in all the selected tahsils of Amravati district.

The most stable crop in Dharni tahsil was Cotton followed by Soybean and Tur.
In case of Chikhaldara tahsil most stable crop was *Kharif* jowar followed by Soybean. In respect of Chikhaldara tahsil *Kharif* Jowar retained 71 per cent stability followed by Soybean 62 per cent stability. In Tiwasa tahsil Soybean retained 100 per cent of its previous area followed by Cotton 71 per cent, Cotton and Black gram 45 per cent.

In Nandgaon tahsil Soybean was the most stable crop and retain 96 per cent of previous area followed by Cotton 76 per cent.

In Bhatkuli tahsil Soybean retained 78 per cent of previous area followed by other crop 51 per cent and Tur 39 per cent.

References

Ananya Chakraborthy.2012.Crop Diversification in Murshidabad District, West Bengal: A Spatio-temporal Analysis. Int.J. of Physics and Social Sci.2(7): 393-403.

Batla Seema. 2008. Regional Dimensions of Inter Crop Diversification in India: Implications for Production and Productivity Growth. Agric. Situ. India, 64(12) : 601-620.

Bhatia, J. and S.K Tewari, 1990.Diversification, growth and stability of agricultural economy in Uttar Pradesh.Agril. Situation in India.45(6) : 397-403.

Chakraborthy A., 2012.Crop diversification in Murshidabad district, West Bengal; A Spatio- Temporal analysis.*Int.J. of physical and social sci* 2(7): 393-403.

Chand, K.P., R. Singh and M.L Sharma, 1986.Diversification of agriculture in Himachal Pradesh- Aspatio temporal analysis.Agril.Situation in India. 41(5):451.

Chinky,S.,l. 2015. Changes in Cropping Pattern and Crop Diversification in Jammu and Kashmir.J.of Humanities and Social Sciences.20(4):7-9.

Dinesh, *et al.,.,* 2007 Crop diversification in Chhattisgarh of north hill area. Agril.Econ.Res.Review 14:121-158

Hafis, C.R., V.R Reddy, S.C. Mathur and P.B Parthasarthy, 1990.Studies on diversification of cropping system and its economics in Watershed Programme. Agril. Situ. in India 45(4):313-318.