



An Economic analysis of crop diversification in Amravati District

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Abstract

Agriculture has been considered a major factor in transforming human societies from small primitive bands into huge technologically advanced nations. The advance of human being is largely due to awareness of progress and need of the cultivation for food production. The process of development is dynamic one involving constant change in strategy, structure and procedure. Due to variations in the soil type, rainfall, cropping pattern and natural conditions. Analyzing the major food grain and non food grain crops occupied more than 80 per cent gross cropped area of tahsils selected in Amravati district. The eight crops were selected purposively for present study like Tur, Mung, Udid, cotton, Soybean, Wheat Gram and other crops. The present study the secondary data were collected from various published sources. To fulfill objectives the data were collected for the period of last 10 years from 2005-06 to 2014-15. Analysis for quantification of crop diversification Index is indicator for observing. In order to quantify extent of diversification Herfindahl and Entropy Index will be computed at different points of time.

The value of Herfindahl Index were varies from 0.32 and 0.45 which was nearer to zero it means in all selected tahsils diversification took place. The diversification from subsistence crop to more commercial crops were took place in these tahsils. The value of Entropy index were varies from 0.60 and 0.99 which is nearer to one. It means diversification is increased in all selected tahsils of Amravati district during the period of study.

Keywords: Crop diversification, Herfindahl and Entropy Index

Introduction

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 is a concept opposite to crop specialization, providing the relative a real 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 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.

Agriculture has been considered a major factor in transforming human societies from small primitive bands into huge technologically advanced nations. The advance of human being is largely due to awareness of progress and need of the cultivation for food production. The process of development is dynamic one involving constant change in strategy, structure and procedure. Due to variations in the soil type, rainfall, cropping pattern and natural conditions.

Methodology

The present study aimed at analyzing the crop diversification in selected tahsils of Amravati district of Maharashtra. The major food grain and non food grain crops occupied more than 80 per cent gross cropped area of tahsils selected in Amravati district. The eight crops were selected purposively for present study like Tur, Mung, Udid, cotton, Soybean, Wheat Gram and other crops. The present study the secondary data were collected from various published sources. Time series secondary data on the area of selected crops, farm harvest prices and other agricultural data were obtained from various published sources. To fulfill objectives the data were collected for the period of last 10 years from 2005-06 to 2014-15. For the present study five tahsils of Amravati district namely Warud, Anjangaon, Achalpur, Dhamangaon Rly. and Chandur Bajar were purposively selected.

Analysis for quantification of crop diversification Index is indicator for observing. In order to quantify extent of diversification Herfindahl will be computed at different points of time.

a) Herfindahl index (HI)

Herfindahl index was computed by taking the sum of squares of acreage proportion of each crop to the total cropped area.

$$HI = \sum_{i=1}^N P_i^2$$

Where,

N= the total number of crops.

P_i= Proportion of acreage under ith crop to total cropped area.

The value of HI is bounded by zero (perfect diversification) and one (complete specification). The value of HI approaches zero as 'N' becomes large and takes value one when only one crop is cultivated.

b) Entropy Index

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

$$EI = \sum_{i=1}^N \{P_i \log \left[\frac{1}{P_i} \right]\}$$

Results and Discussion

The analysis of changes in cropping pattern indicates that changes over study period were took place in selected tahsils of Amravati district. Hence an attempt was made to examine the level of crop diversification in selected tahsils of Amravati district at different points of time. Herfindahl and Entropy index was used to measure the level of crop diversification in present study.

a) Measurement of crop diversification by Herfindahl Index

Table 1 Measurement of crop diversification by Herfindahl index

Year	Warud	Anjangaon	Achalpur	Dhamangaon Rly.	Chandur Bajar
2005-06	0.41	0.4	0.38	0.4	0.41
2006-07	0.43	0.38	0.37	0.41	0.41
2007-08	0.4	0.4	0.38	0.35	0.43
2008-09	0.42	0.38	0.36	0.37	0.4
2009-10	0.45	0.36	0.37	0.38	0.45
2010-11	0.4	0.39	0.38	0.32	0.39
2011-12	0.4	0.4	0.39	0.39	0.4
2012-13	0.41	0.4	0.38	0.39	0.42
2013-14	0.38	0.37	0.36	0.38	0.37
2014-15	0.39	0.37	0.37	0.38	0.39

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 nearer to zero when there is perfect diversification. Accordingly it is presented in Table 1.

The Table 1 revealed that in all the selected tahsils of Amravati district, the value of Herfindahl Index were varies from 0.32 (corresponding to Dhamangaon Rly.

tahsil during year 2010-11) and 0.45 (corresponding to Warud and Chandur Bajartahsils during year 2009-10) which was nearer to zero it means in all selected tahsils diversification took place. The diversification from subsistence crop to more commercial crops were took place in these tahsils. Hence the hypothesis framed regarding the crop diversification is occurred in selected tahsils of Amravati district over a period of time is proved.

b) Measurement of crop diversification: Entropy index

Table 2. Measurement of crop diversification: Entropy index

Year	Warud	Anjangaon	Achalpur	Dhamangaon Rly.	Chandur Bajar
2005-06	0.66	0.63	0.98	0.99	0.99
2006-07	0.6	0.64	0.9	0.98	0.97
2007-08	0.68	0.69	0.86	0.99	0.96
2008-09	0.78	0.68	0.96	0.91	0.82
2009-10	0.69	0.69	0.97	0.95	0.89
2010-11	0.67	0.67	0.94	0.89	0.78
2011-12	0.68	0.68	0.95	0.9	0.8
2012-13	0.77	0.7	0.95	0.89	0.79
2013-14	0.79	0.77	0.93	0.86	0.72
2014-15	0.75	0.76	0.91	0.83	0.65

The table 2 presents Entropy index in selected tahsils of Amravati district. Entropy index is also a measure of concentration. The value of Entropy index varies from zero to one. It takes the value one when 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 district the value of Entropy index were varies from 0.60 (corresponding to Warud tahsil during year 2006-07) and 0.99 (corresponding to Dhamangaon Rly. tahsil during year 2005-06 and 2007-08 and Chandur Bajartahsil during the year 2005-06) which is nearer to one. It means diversification is increased in all selected tahsils of Amravati district during the period of study.

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