Trend and Pattern of Crop Diversification in West Bengal During Post Liberalisation Era: An Application of Cluster Analysis

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Abstract

Crop diversification is one of the most important risk management and income enhancing strategies for farmers. It is practiced by the farmers in West Bengal as a risk mitigating strategy. The present study attempts to investigate the trend and pattern of crop diversification across districts of West Bengal during the post liberalization era. The analysis is based on secondary data. The period under study has been divided into four sub-periods, namely, Triennium Ending (TE) 1992-93, TE 2002-03, TE 2012-13 and TE 2019-20. The number of districts selected for the purpose of study are seventeen (17). The four major indices of crop diversification, namely, the Simpson's index, the Composite Entropy index, the Modified Entropy index and the Herfindahl index have been used to estimate the magnitudes of diversification for different districts of West Bengal. The average magnitude of crop diversification of the state as a whole has increased over time from Triennium Ending 1992-93 to Triennium Ending 2019-20 measured in terms of all four indices (the decreasing magnitude of Herfindahl index implies increasing crop diversification). There are seven districts above the state average in terms of their respective magnitudes of crop diversification as per the indices chosen during the first two sub periods, while in the two subsequent sub periods, the number of districts above the state average has increased to eight. Nadia, Murshidabad and Malda remained at the top of the list throughout the period under study. The magnitudes of diversification for these districts are above 0.8 irrespective of the index chosen (excepting Herfindahl index). The lowest magnitudes of crop diversification are recorded in the districts of Purulia and South 24 Parganas in terms of the four indices selected during the entire study period. The district of Purulia has registered the lowest magnitude of diversification throughout the study period, which is below 0.4, irrespective of the index chosen (excepting Herfindahl index). The Cluster analysis has been applied for grouping the districts in terms of the degrees of diversification. Here Hierarchical clustering method has been used and the districts are classified using Ward's Method under Agglomerative clustering. The results show that the districts of West Bengal and the state as a whole have exhibited higher crop diversification in new millennium compared to the nineties.

Keywords: Crop Diversification, Cluster Analysis, Composite Entropy Index, Herfindahl Index, Modified Entropy Index, Simpson's Index,

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I. Introduction:

The agriculture and allied sector continue to be pivotal to the sustainable growth and development of the Indian economy. Not only does it meet the food and nutritional requirements of 1.3 billion Indians, it contributes significantly to production, employment and demand generation through various backward and forward linkages leading to a multiplier impact on the gross domestic product of the economy. Moreover, the role of the agricultural sector in alleviating poverty and in ensuring the sustainable development of the economy is also well established. The sector is, however, currently facing a dilemma. While it has made large strides in achieving the agricultural development goals of food security, availability and accessibility, it is still being challenged by a formidable agrarian crisis in the form of 'farmers' welfare'. This situation has recently led a to fresh thinking on the developmental approach in the agricultural sector. The need for focusing on the welfare and prosperity of the farmers has gained prominence (State of Indian Agriculture 2015-16, Ministry of Agriculture & Farmers Welfare, Government of India).

Indian agriculture is predominantly a small and marginal peasant based economy with approximately 85% of the operational holdings lying below two hectares and at the same time only 44.58% of the agricultural land being cultivated by them (Agriculture Census 2010-11). Because of small operational holdings, it is indeed very difficult for the small farmers to improve their earnings only by raising the yields of the existing crops, mainly cereals. However, with the availability of modern farm inputs in recent times, farmers have a ready