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Resource-use efficiency of rice production in the state of Odisha, India

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Abstract

In Odisha, food and nutrition security should be augmented, keeping population growth and future requirements in mind. While doing so, the productivity of rice should be raised. In order to raise the productivity of rice in the state of Odisha, the resources should be optimally utilised to get the maximum product out of the minimum possible input. This study was conducted in Odisha during 2016–17. Data about rice production, productivity, input use, costs and profitability were obtained from various issues of Odisha Statistical Abstract, the Department of Economics and Statistics, and the Ministry of Agriculture. The analysis examined rice resource productivity and profitability using two indicators MVP (Marginal Value Product) and MFC (Marginal Factor Cost) ratio. Furthermore, the technical efficiency of paddy production was estimated through the Stochastic Frontier Production (SFP) function and its estimated parameters. The Cobb-Douglas production function's maximum likelihood estimate is reported. The results of the analysis of MVP and MFC show that in all inputs, the value was less than one, indicating the overuse of the resources. The variance sigma square for the SFP model was found statistically significant, indicating the models are stochastic rather than deterministic. The estimated variance parameters sigma square U and sigma square V significantly differed from zero, indicating that the inefficiency in paddy production was not due to chance alone but to individual inefficiency. Further, the value of Lambda, depicting the degree of asymmetry in the distribution composite error term, was significant, suggesting the existence of a high degree of technical inefficiency and dominance of a one-sided error component. The value of gamma, which has a 46.6 % variation in paddy productivity, could be attributed to technical efficiency. Based on the results, the government should create easy access to supply farm inputs at a subsidy rate to the farmers to reduce the cost of rice cultivation and improve the profit margin of farmers. Steps must be taken to strengthen the extension services, access to machinery and improving technical knowledge.

Keywords: Cobb-Douglas, India, resource use efficiency, rice production