

## ABSTRACT

Ensuring food security is the second UN Goal on sustainable development. As the scope for expansion of area under rice cultivation is limited, the emphasis should mostly be on the productivity growth, which can be achieved through the adoption of modern technology practices and efficient use and allocation of resources. The contemporary research on productivity with the consideration of adoption of modern technology practices and analyzing the technical, allocative, and economic efficiency levels of farms for major food grains like rice at a micro level is largely missing in India specifically in Assam. To achieve sustained growth of rice production for providing food security to the growing population and to realize the potentials of rice production efficiently, productivity analysis of existing rice production system, analysis of the adoption of modern production technology with its determinants, and analysis of the resource use efficiency are critical. The present research attempts to address some of such issues in the context of Assam. The present study is based on the primary data collected through an in-depth primary survey of 487 rice farmers in four districts across four major agro-climatic zones of Assam. The study concludes that the level of modern technology adoption is low and mixed. Among a host of socio-economic factors, the output price is an important determinant of technology adoption. Limited extension services, access to credit, farming experience, land tenure, farm size, and fragmented land are the strongest determinants of all. The analysis of farm-specific technical inefficiency level of the rice-farming households shows the existence of a level of inefficiency in rice farming. A change in the exogenous factors that adversely influence the productive efficiency of the farmers and the improvement of managerial practices may increase the scope for productivity enhancement. The results show that there exists gross inefficiency in the allocation of productive resources among the rice farmers in the study area. In Assam, the majority of the farmers are poor and marginal. Thus, access to extension services, subsidized inputs, and agricultural loans play a vital role to improve efficiency and productivity. The productivity level in the state is low as compared to the national level. The level of productivity is influenced by a host of factors like human factors, physical factors, financial factors, and social factors. It is found that the adoption of modern technology practices and economic efficiency level are also playing a significant role in the productivity enhancement process. The present study provides essential tools to the policymakers concerning the provision of government support services, credit facility, developing market infrastructure, and market linkages. Policies like cooperative farming and awareness camp related to different modern farming practices may further improve the scenario in the state.

**Keywords:** Adoption; modern technology practices; efficiency; productivity; rice.