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## Comparison of Technical Efficiency between Boro Rice and Maize Production in the Northern Region of Bangladesh

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### Abstract

This study examines the scale and technical efficiency of Boro rice and maize cultivation in northern Bangladesh, focusing on the Dinajpur and Lalmonirhat districts. Utilizing stochastic production frontier analysis, the research assesses the key factors affecting production efficiency and resource utilization among smallholder farmers. The findings indicate that maize producers demonstrate higher technical efficiency compared to Boro rice farmers, with efficiency levels for maize often surpassing 90%. Fertilizer use is crucial in enhancing maize productivity, while labor plays a significant role in the cultivation of both crops. Additionally, younger and more experienced farmers exhibit higher efficiency, highlighting the importance of human capital in agricultural productivity. Despite these improvements, challenges remain, such as limited access to extension services, credit facilities, and quality inputs, which hinder the potential of both maize and Boro rice farmers. The study also identifies inefficiencies among Boro rice farmers, attributed to suboptimal resource utilization and a lack of adoption of productivity-boosting practices. For maize, the complementarity between labor and fertilizer use suggests opportunities for integrated resource management strategies to boost output. The findings align with previous research, emphasizing that efficiency gains can be achieved through targeted interventions, including improved access to timely services, training programs, and financial support. The insights provided are valuable for policymakers, extension agents, and stakeholders working to promote sustainable agricultural practices and improve productivity in Bangladesh's smallholder farming systems.

**Key Words:** *Technical Efficiency, Boro Rice Farmers, Maize Production, Stochastic Production Frontier*

