

## **Effect of Urea Deep Placement Technology Adoption on the Production Frontier: Evidence from Irrigation Rice Farmers in the Northern Region of Ghana**

**Authors :** Shaibu Baanni Azumah, William Adzawla

**Abstract :** Rice is an important staple crop, with current demand higher than the domestic supply in Ghana. This has led to a high and unfavourable import bill. Therefore, recent policies and interventions in the agricultural sub-sector aim at promoting various improved agricultural technologies in order to improve domestic production and reduce the importation of rice. In this study, we examined the effect of the adoption of Urea Deep Placement (UDP) technology by rice farmers on the position of the production frontier. This involved 200 farmers selected through a multi stage sampling technique in the Northern region of Ghana. A Cobb-Douglas stochastic frontier model was fitted. The result showed that the adoption of UDP technology shifts the output frontier outward and also move the farmers closer to the frontier. Farmers were also operating under diminishing returns to scale which calls for redress. Other factors that significantly influenced rice production were farm size, labour, use of certified seeds and NPK fertilizer. Although there was an opportunity for improvement, the farmers were highly efficient (92%), compared to previous studies. Farmers' efficiency was improved through increased education, household size, experience, access to credit, and lack of extension service provision by MoFA. The study recommends the revision of Ghana's agricultural policy to include the UDP technology. Agricultural Extension officers of the Ministry of Food and Agriculture (MoFA) should be trained on the UDP technology to support IFDC's drive to improve adoption by rice farmers. Rice farmers are also encouraged to expand their farm lands, improve plant population, and also increase the usage of fertilizer to improve yields. Mechanisms through which credit can be made easily accessible and effectively utilised should be identified and promoted.

**Keywords :** efficiency, rice farmers, stochastic frontier, UDP technology

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