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Fertilizer Usage and Technical Efficiency of Rice Farms under Tropical Conditions: A Data Envelopment Analysis (DEA)

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ABSTRACT This study employed an output-oriented DEA approach to evaluate the impact of fertilizer usage on the technical efficiency of rice farms in Kogi state, Nigeria. Results suggest that rice farms with fertilizer could expand output potentially by 74 percent and 61 percent as compared to 77 percent and 66 percent for rice farms without fertilizer under constant returns to scale and variable returns to scale respectively. This can be achieved without altering the quantities of inputs used. Furthermore, the corresponding average scale efficiency of 77 percent and 79 percent for rice farms with and without fertilizer respectively suggests that by operating on an optimal scale, a further increase in output can be realized beyond the projected values by as much as 23 percent and 21 percent correspondingly. Thus, rice farmers should be encouraged to adopt optimum fertilizer rate in order to achieve increase in rice production. This can be accomplished through education, proper execution of fertilizer price subsidy as well as early distribution of fertilizer to farmers.