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Factors Influencing Technical Efficiency of Paddy Farms in Mullaitivu District: Non – Parametric Approach

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Abstract

Technical efficiency means the effectiveness which a given set of inputs used to produce a given output and it helps to produce the maximum output using minimum quantity of inputs for any firm or farm products. The objectives of this study are to estimate the Hicks – Moorsteen index and examine the impact of demographic, economic, farming and environmental characteristics on total factor productive efficiency index. Further, this study evaluate the overall performance of paddy farmers (n= 200) and identify the factors affecting the efficiency using two – stage Data Envelopment Analysis (DEA) during 2019/2020 period in Mullaitivu district of Sri Lanka. Hicks – Moorsteen index showed that among the components of the index, 94% of the highest mean value was attained in Input Oriented Technical Efficiency (ITE) followed by 93% of efficiency was attained in Output Oriented Scale Efficiency (OSE). Tobit regression results suggested that education, availability of training and destroy the crops whether the crops were damaged by environmental factors were significantly affecting the Hicks – Moorsteen index. Further, results of two – stage input-oriented DEA revealed that on average the overall technical efficiency of paddy farms was nearly 42%, scale efficiency was nearly 45% and variable returns to scale technical efficiency was nearly 93%. The Tobit regression results showed that, education, land ownership, amount of savings, loan size, land quality and farm income were positively impact on overall technical efficiency while experience, ownership of land, amount of savings and destroy the crops whether the crops were damaged by environmental factors significantly affected on technical efficiency. Conversely, scale efficiency of paddy farming mostly influenced by education, land ownership, saving amount, loan size, quality of land and farm. The paper concludes that both

input oriented technical efficiency and output oriented scale efficiency need to be improved further as well as scale efficiency mostly affected by economic and farming characteristics in the study.

Keywords: - Farming characteristics, Hicks – Moorsteen index, Scale efficiency, Tobit regression, Two – stage data envelopment analysis.