

WELFARE IMPLICATIONS OF RAISING TECHNICAL EFFICIENCY IN RICE FARMING UNDER MAJOR IRRIGATION IN SRI LANKA

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Sri Lanka reached self-sufficiency in rice production by the year 2010. The National Food Production Programme (2016-2018) envisages increasing domestic rice production from year 2015 by 24% between 2016 and 2018. A substantial increase of domestic supply would suppress domestic prices and erode welfare of rice farmers. The objective of this study is to examine how raising technical efficiency of rice farmers in areas under major irrigation affects the incomes of rice farmers and consumers. Stochastic frontier production functions of Cobb-Douglas form were estimated for samples of 440 farms under major irrigation of five districts and three Mahaweli systems for *Yala* 2009, and 488 farms of six districts and three Mahaweli systems in 2009/10 *Maha*. Results of the stochastic frontier production function analysis were incorporated into classical welfare analysis framework to measure welfare effects of raising technical efficiency. The relationship of the ratio of actual output to estimated output as technical efficiency, and aggregate production estimates are used for estimation of the potential aggregate production in major irrigated areas. Price elasticity of demand of rice was assumed to be -0.75 for the purposes of the study. In the stochastic frontier production functions, estimated elasticities of production are significant at 1% level for land, labour and machinery services for 2009 *Yala* season, and of land, labour, seed cost and machinery services for the *Maha* 2009/10 season. The averages of output-oriented efficiency indices are 0.75 of *Yala* season and 0.81 of *Maha* season. The potential production increases associated with averages of technical efficiencies, in average are 33% for *Yala* and 24% for *Maha*. The welfare losses due to fall of price exceed the gains due to yield increases associated with raising technical efficiency in either season resulting welfare losses to farmers, and gains of welfare to consumers, and to the society as a whole. The estimated loss of welfare in major irrigated areas is Rs 7.5 billion in *Yala* 2009 and Rs 6.2 billion in *Maha* 2009/10 with an annual loss of Rs 13.7 billion. However, total welfare gain to consumers is Rs 52.1 billion. The annual producer loss is Rs 25.7 billion leading to a net social gain of by Rs 27.4 billion.

Keywords: Rice, Technical efficiency, Classical welfare analysis, Stochastic frontier Production function