CROP-SPECIFIC PRODUCTIVITY AND EFFICIENCY OF BANGLADESH RICE CROPS AND DEVELOPMENT POLICY

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Abstract
The rice production of Bangladesh has been investigated using a Cobb-Douglas stochastic frontier production function which incorporated a model for the technical inefficiency effects. The farm level primary data which is used for this study has been collected by stratified random sampling technique. The per hectare production, cost, gross, net returns and benefit cost ratio were the highest for Boro rice. The factors identified in the stochastic production frontiers which are responsible for the increase of Aus rice production are irrigation cost, land under production, experience and education. For Aman rice, fertiliser, manure, land under production and education were important variables for the increase in production. For increasing the production of Boro rice, fertiliser, manure, ploughing cost, irrigation

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cost, insecticide cost and land under production were found to be important variables. Cobb-Douglas stochastic production frontiers included the farm-specific factors such as age, education, experience, family size and land under house. Experienced farmers tend to have smaller inefficiencies than younger and less experienced farmers. There were significant technical inefficiency effects in the production of Boro rice. As a policy, Aus and Aman rice crops production cannot be increased by increasing efficiency with existing technology. In this case a new advanced technology is needed to increase production. But for Boro rice, about 14% of production can be increased by increasing the technical efficiency only.

I. INTRODUCTION

Decisions about development strategies in agriculture are in part guided by farm level performances. These farm level performances can be attained in two ways such as to maximise output with the given set of inputs under existing production technology or to minimise production cost to produce a prescribed level of output. The former concept is known as technical efficiency. Technical efficiency is used as a measure of a firm's ability to produce maximum output from a given set of inputs under certain production technology. It is a relative concept insofar as the performance of each production unit is usually compared to a standard. This standard may be used on farm-specific estimates of best practice techniques (Herdt and Mandac 1981) but more commonly by relating farm output to population parameters based on production function analysis (Timmer 1971). A technically efficient firm will operate on its frontier production function. Given the relationship of inputs in a particular production function, the firm is technically efficient if it produces on its outer-bound production function to obtain the maximum possible output, which is feasible under the current technology. Putting it differently, a firm is considered to be technically efficient if it operates at a point on an isoquant rather than interior to the isoquant.

The measurements of crop-specific technical efficiency get momentum with increasing demands for rice in three different seasons in Bangladesh. Crop-specific efficiency measurements are particularly important for developing countries like Bangladesh where fluctuation of resources of farm households occur in different seasons. The financial stresses of farm households require judi-