



Sam Houston State University

Department of Economics and International Business

Working Paper No. 16-03

January 2016

**A Generalized Stochastic Production Frontier
Analysis of Technical Efficiency of Rice Farming:
A Case Study from Assam, India**

Aditi Bhattacharyya*

Department of Economics and International Business
Sam Houston State University
axb023@shsu.edu

Raju Mandal

Department of Economics
Assam University, Silchar, India
rajum06@gmail.com

*This study is partially supported by the COBA Summer Research Grant 2014 at Sam Houston State University, Huntsville, TX.

Abstract

Purpose:

This study analyzes farm-level technical inefficiency of rice farming in Assam, India, using a multiple-output generalized stochastic frontier framework.

Design/Methodology/Approach:

Primary data for this study was collected in 2009-2010 from 310 farm-households in four non-contiguous districts of Dhubri, Morigaon, Dibrugarh, and Cachar that are located in different agro-climatic regions of Assam. Based on a Cobb-Douglas production function for multiple rice varieties, the paper simultaneously estimates the Generalized Stochastic Production Frontier and examines effects of exogenous factors on farm-level technical inefficiency.

Findings:

Results of this study show that the average technical inefficiency of farms is 8.5% in the sample. Further, inefficiency is lower in the frequently flood prone areas, and availability of government support helps reduce such inefficiency as well. However, technical efficiency is higher for the Muslim farm-households, and it decreases with greater land fragmentation. The study also finds that the use of primitive technology like bullock reduces technical efficiency of rice farming.

Originality/Value:

This paper is based on a novel data set that has specially been collected to examine productivity and efficiency of rice cultivation in the flood plains of Assam that has not been studied before. Further, to the best of our knowledge, this paper is the first one to model rice production as a multiple-output stochastic production frontier and analyze technical efficiency of rice production accordingly.

Keywords: Generalized Stochastic Production Frontier, Rice Farming, Technical Inefficiency, India

JEL Codes: D24, Q12