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# Role of Agricultural Credits in Rice Productivity in Bangladesh - A Stochastic Frontier Approach

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University of Rajshahi

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**Role of Agricultural Credits in Rice Productivity**

**in Bangladesh - A Stochastic Frontier Approach**



**By**

**Md. Nurunnabi Miah**

B.S.S. (Honours) in Economics, M.S.S. in Economics

A Thesis Submitted to the University of Rajshahi for the  
Degree of  
Master of Philosophy  
in  
Economics

Department of Economics  
University of Rajshahi  
Rajshahi - 6205  
Bangladesh

June, 2008

**Role of Agricultural Credits in Rice Productivity  
in Bangladesh - A Stochastic Frontier Approach**



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## Certificate

I have the pleasure to certify that the thesis entitled, "Role of Agricultural Credits in Rice productivity in Bangladesh – A Stochastic Frontier Approach," is the original work of Md. Nurunnabi Miah. It is the candidate's own achievement and is not a conjoint work. The thesis is prepared under my direct supervision and guidance.

I also certify that I have gone through the draft and final version of this thesis and found it satisfactory for submission to the University of Rajshahi, Bangladesh for the degree of MASTER OF PHILOSOPHY in Economics.

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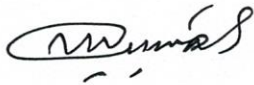
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Date: 30.06.08

## Declaration

I do hereby declare that the thesis entitled, "Role of Agricultural Credits in Rice Productivity in Bangladesh - A Stochastic Frontier Approach" submitted to the Department of Economics, Rajshahi University, Rajshahi, Bangladesh for the degree of Master of Philosophy in Economics, is an exclusively original work of mine. No part of it, in any form, has been submitted to any other university or institute for any degree, diploma or other similar purposes.



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*Dedicated*  
*to*  
*My*  
*departed Parents*

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## Abstract

Agriculture sector in Bangladesh is the largest contributor to income and employment. About 77 percent of the total population and 78 percent of rural labour force are located in rural areas. Agriculture sector provides 63.2 percent of employment opportunities and 72 percent of rural employment. Moreover, 23.31 percent of country's GDP comes from agriculture. The production and employment opportunities either in agriculture or outside of it are circled around rice productivity.

This thesis is a study of role of agricultural credits in rice productivity in Bangladesh by using stochastic frontier approach. The data used in the study are based on a survey of 200 rice cultivators from two villages, Kaur and Barigaon, which respectively represent agriculturally advanced in Bagmara Upazila of Rajshahi district. The villages were selected purposively, while the rice cultivators were selected by adopting stratified random sampling design. The selected cultivators in each villages were classified into seven size categories. The role of credit, the supply of credit, the share of different agencies, the utilization patterns, the interest rates and the existing credit gaps were studied and compared between the villages and among the size categories.

It has been observed that farms adopting superior techniques of cultivation reported substantially higher credit requirements per household and per bigha. The analysis shows that 31 percent cultivators completely and 69 percent cultivators partly depend on credit.

In both Kaur and Barigaon, cultivators belonging to the larger size categories received larger proportion of their loans at 15 percent interest rates from the institutional sources while smaller cultivators paid about 30 percent interest rate for larger parts of their total loans from the NGOs.

A big credit gap exists in Kaur village, and there are small or partial credit gaps in the Barigaon village. Cultivators in Kaur village bridged a portion of the needs by undertaking disinvestment of assets. An overwhelmingly large proportion of disinvestment of assets was caused by the demands of agricultural expenditure.

We examine the role of agricultural credits in rice productivity using the stochastic frontier approach. We investigate factors associated with technical inefficiency. Technical efficiency is computed by estimating the Cobb-Douglas stochastic frontier in which technical inefficiency effects are modeled as a function of age and experience of the rice cultivators, education of the cultivators, agricultural credits and land fragmentation factors we estimate the model in a single stage estimation technique using maximum likelihood method.

The Cobb-Douglas stochastic frontier results show that the rice cultivators of the study area are 97 percent technically efficient on an average. An evaluation of factors associated with technical efficiency reveals that education, credit facilities and land size are inversely related to inefficiency of rice farm. This implies that the education, credit and land size are positively affecting efficiency performance of rice farmers, hence increasing output and revenue. Policies should be taken to increase rural credit facilities and to reduce land fragmentation.

# **Role of Agricultural Credits in Rice Productivity in Bangladesh - A Stochastic Frontier Approach**

	<b>page</b>
<b>Contents</b>	<b>ii</b>
Certificate	<b>iii</b>
Declaration	<b>iv</b>
Dedication	<b>v</b>
Acknowledgements	<b>vii</b>
Abstract	<b>ix</b>
Contents	<b>1 - 5</b>
<b>Chapter 1 Introduction</b>	
1.1. Introduction	
1.2. Contribution to GDP	
1.3. Crops	
1.4. Role of Agricultural Credits	
1.5. Aim and Objectives of this Study	
1.6. Organization of the study	
<b>Chapter 2 Review of Literature</b>	<b>6 - 13</b>
2.1. Introduction	
2.2. Conclusion	
<b>Chapter 3 Survey Methodology and Results</b>	<b>14 - 41</b>
3.1. Introduction	
3.2. Methodology of the Survey	
3.2.1. Framework of the Field Work Survey	
3.2.2. Questionnaire Design	
3.2.3. Sampling Strategy and Sample Size	
3.2.4. Policy to ensure correctness in the accumulation of Data	
3.2.5. Primary data Collection	

- 3.3. Results of Survey
  - 3.3.1. Age Distribution in the Study Area
  - 3.3.2. Years of Schooling in the Study Area
  - 3.3.3. Ownership and Size of Rice Cultivated Land
  - 3.3.4. Ownership of Rice Cultivated Land
- 3.4. Cost of Input
  - 3.4.1. Per bigha rent cost of Rice cultivated Land in the study Area
  - 3.4.2. Pattern of Used Labour and Labour Cost Per Bigha for Rice Cultivation in the Study Area
  - 3.4.3. Per bigha Ploughing Cost in the Study Area
  - 3.4.4. Per bigha Seed Cost in the Study Area
  - 3.4.5. Per bigha Irrigation Cost in the Study Area
  - 3.4.6. Per bigha Fertilizer Cost in the Study Area
  - 3.4.7. Per bigha Pesticides Cost in the Study Area
  - 3.4.8. Per Bigha Average Total Variable Cost of Aus, Aman and Boro Rice
  - 3.4.9. Per Bigha Average Total Revenue of Aus, Aman and Boro Rice
  - 3.4.10. Per Bigha Average Total Profit of Aus, Aman and Boro Rice
- 3.5. Limitations of the Collected Data
- 3.6. Summary and Conclusion

#### **Chapter 4 Setting of the Study Villages and Land Distribution of the Sample Households**

42 - 58

- 4.1. Introduction
- 4.2. Salient Features of the Study Area
- 4.3. Selected Upazila Bagmara
- 4.4. Location of the Study Area
- 4.5. Kaur Village
- 4.6. Barigaon Village
- 4.7. Socio-economic Features of Respondents in the Study Area
- 4.8. Structure of Household Family
- 4.9. Farm Size and Land Ownership

- 4.10. Operational Arrangement of Land Holding
- 4.11. Extent of Irrigation of Sample Households
- 4.12. Calendar of Rice Cultivation in Bangladesh
- 4.13. Cropping Pattern
- 4.14. Sources of Fund for Rice Cultivation of Respondents
- 4.15. Season Wise Credit Requirements of the Cultivators
- 4.16. Conclusion

### **Chapter 5 Credit Needs : A Purpose-wise Analysis**

59 - 74

- 5.1. Conclusion
- 5.2. Credit Needs According to Season and all Purposes
- 5.3. Total Credit Needs According to Farm Size Group
- 5.4. Credit Needs per Bigha of Owned Land
- 5.5. Credit Needs According to Specific Purposes
- 5.6. Per Household and Percentage Credits Needs towards on Farm all Purposes
- 5.7. Per Household and Per Bigha Credit Need Towards Capital Expenses
- 5.8. Credit Needs Towards on Farm all Purposes
- 5.9. Per Bigha Credit Need on Operated Land for on Farm Current Expenses
- 5.10. Distribution of Purpose-wise Credit Needs in Different Farm Size Categories
- 5.11. Conclusion

### **Chapter 6 The Supply of Credit, Its Distribution, Uses and Shortfalls**

75 - 94

- 6.1. Introduction
- 6.2. Relative Shares of Institutional and Non-Institutional Loan
- 6.3. Share of Institutional and Non-Institutional Credit in the Total Borrowings of Cultivators.
- 6.4. Source-wise Credit Supply in Different Rice Farms
- 6.5. Average Amount of Borrowing From Various Sources
- 6.6. Average Credit from all sources
- 6.7. Total Share of Institutional, NGOs and Non-institutional Credit
- 6.8. Per Household and Per Bigha Credit Supply of Different Farm Size and Categories

6.9. Uses of Credit	
6.10. Credit Gap	
6.11. Disinvestment of Assets as Land	
6.12. Conclusion	
<b>Chapter 7 Theoretical Issues : Production Function and Efficiency</b>	<b>95 -107</b>
7.1. Introduction	
7.2. Production Function	
7.3. Cost Minimizing Input Combination	
7.3.1. Graphical Presentation	
7.3.2. Mathematical presentation	
7.4. Measures of Efficiency	
7.4.1. Defining Efficiency	
7.4.2. Graphical Representation	
7.5. Summary and Conclusions	
<b>Chapter 8 Empirical Methodology of Efficiency Measurement: The Stochastic Econometric Frontier</b>	<b>108 - 119</b>
8.1. Introduction	
8.2. Stochastic Frontier Production Function and Efficiency Estimation	
8.3. Functional Forms of Production Function	
8.3.1. Functional Forms	
8.4. Summary and Conclusion	
<b>Chapter 9 Empirical Results : The Stochastic frontier Model</b>	<b>120 - 134</b>
9.1. Introduction	
9.2. Summary Statistics and Explanation of the Variables	
9.3. Factors Determining / Affecting Cultivator Inefficiency	
9.3.1. Stochastic Frontier and Technical Efficiency: Results	
9.4. Cobb-Douglas Stochastic Frontier Results	
9.4.1. Technical Inefficiency Results	
9.4.2. Estimates of Technical Efficiency	

9.5. Summary and Conclusion	135 - 143
<b>Chapter 10 Summary and Conclusion</b>	
10.1. Introduction	
10.2. Summary of Results	
10.3. Conclusion and Recommendations	
10.4. Further Research	
<b>Appendix</b>	<b>144 - 154</b>
<b>Bibliography</b>	<b>155 - 164</b>