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A COMPARATIVE FINANCIAL ANALYSIS OF AUS RICE AND JUTE PRODUCTION IN SOME SELECTED AREAS OF MYMENSINGH DISTRICT

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ABSTRACT

This study is designed to determine the costs and returns and relative profitability of an early variety aus rice and jute in greater Mymensingh. It was revealed that the cultivation of aus rice and jute was a profitable business from the viewpoint of farmers. Per hectare gross costs of production of aus rice and jute were Tk. 42945 and Tk. 63906 respectively and the corresponding gross returns were Tk. 43323 and Tk. 75391, respectively. The per hectare net returns of producing aus rice and jute were Tk.378 and Tk. 11484, respectively. Partial budgeting analysis revealed that the jute growers were benefited an amount of Tk. 11108/- per hectare than the aus growers. Cobb-Douglas production function was applied to realize the specific effects of individual inputs on production of aus rice and jute. It was observed that most of the included variables had significant impact on aus rice and jute production. Among the included variables, four variables namely human labor, seed, fertilizer and manure had positive and significant impact on returns from both aus rice and jute production. The major problems of the study were seed purity level, insufficient water and irrigation facility and higher input costs.

Key words: Aus rice, comparative financial analysis, jute, production, profitability.

INTRODUCTION

Bangladesh is an agro-based country and agriculture remains the most important sector of the economy of this country which contributes 19.95% of the total GDP of Bangladesh (BBS 2009). Rice and jute are the main crops of this sector. Rice is grown for domestic consumption while jute is the vital source of foreign exchange earnings (BJRI 2006). Rice is the staple food for the people of Bangladesh. On the other hand, jute as the golden fibre of Bangladesh has been considered an important source of foreign exchange earnings of the country. It is an important cash crop in Bangladesh and India which together accounts for about 84 percent of world production of jute fibre (JDPC 2006). Bangladesh is the major jute producing country of the world. About 25 million people depend on jute and jute related activities directly or indirectly. Due to the diversified usage, a huge number of populations are involved in aus rice and jute production. The researchers reviewed Hossain 1995; Jabbar 1971; Khatun 2010; Mannan 2001; Rahman 1979; Talukder *et al.* 1991; Talukder *et al.* 1993 and Azad *et al.* 1986 but few of them studied the comparative profitability of producing aus rice and jute. The present study was undertaken with a view to analyze the comparative advantage of producing jute and aus rice; that will give a proper idea to go for particular crops. Considering the importance of the study the following objectives were formulated for this study namely as to document the socio-economic profiles of the Aus rice and jute growers; to compare the relative profitability of Aus rice and jute production; to estimate the major factors affecting the financial returns of aus rice and jute; and to suggest some policy guidelines.

MATERIALS AND METHODS

Keeping the objectives in mind, the present study was carried out in five villages of Mymensingh Sadar Upazila of Mymensingh district. Survey method was used for data collection by interviewing respondents. In this study, the area was selected purposively and the farmers were selected randomly for minimizing cost, time and to achieve the ultimate objectives of the study. In total 60 farmers were randomly selected taking 30 from aus rice and another 30 from jute growers. The data were collected by the researcher himself during August 2010. The collected data were then stored and scrutinized. Costs and returns analyses were done on both variable and total cost basis. In comparing the profitability between aus and jute, the present study used partial budgeting method. Finally econometric technique such as Cobb-Douglas production function (Gujarati 1995) was used to

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examine the effects of the independent variable on the dependent variables in the production of aus rice and jute. The specification of the Cobb-Douglas production functional was as follows:

$Y_i = aX_1^{b1}X_2^{b2}X_3^{b3}X_4^{b4}X_5^{b5}X_6e^{ui}$

In the Linear form it can be written as follows:

$1nY = Ina + a_1 \ln x_1 + a_2 \ln x_2 + a_3 \ln x_3 + a_4 \ln x_4 + a_5 \ln x_5 + a_6 \ln x_6 + U_i$

Where,

Y = Return per hectare in taka
X_1= Human labor cost (Tk./ha)
X_2=power tiller cost (Tk./ha)
X_3 =Seed cost (Tk./ha)
X_4=Fertilizer cost (Tk./ha)
X_5=Cow dung cost (Tk./ha)
X_6= Insecticides cost (Tk./ha)
a=Constant or intercept term

$a_1, a_2, a_3, a_4, a_5, a_6$ = production coefficient of the respective inputs variables to be estimated and
U_i = Error term

RESULTS AND DISCUSSION

Socioeconomic characteristics of the respondents: In this study the analysis of socioeconomic characteristics of the selected farmers showed that basically there was no significant difference in the characteristics of aus rice and jute growers. In this study 27 percent of the aus farmers fell into the less than 40 years of age bracket. About 63 percent were between 40-50 years and 10 percent farmers belonged to above 50 years of age bracket. About 10 percent of the jute farmers fell into the less than 40 years of age bracket , 70 percent were between 40-50 years group and 20 percent farmers belonged to above 50 years of age of age bracket . It appears from the study 70 percent aus growers families of the study area consists of 4-5 members, 17 percent consist of 0-3 members and only 13 percent families consist of more than 5 members. On the other hand 66 percent jute growers families consist of 0-3 members, 27 percent families consist of above 5 members and 7 percent family consist of 0-3 members. So, both of the aus and jute respondents have family relatively in medium size (Table 2). However, it was found that 27 percent of aus farmers are illiterate, 46 percent had primary education and 17 percent had up to secondary education and only 10 per cent had above secondary level education. On the other hand, 23 percent of jute farmers are illiterate, 44 percent had primary education, 30 percent had up to secondary education and only 3 per cent had above secondary level education (Table 3).

Cost and return analysis: In case of aus rice the total labor requirement per hectare was 104.01 man-days of which 14.36 man-days were family supplied and 89.65 man-days were hired labor. Total cash cost for hired labor was TK. 19828 and per hectare family labor cost was estimated at Tk. 3107.5. In case of jute production, the total labor requirement per hectare was 170.78 man-days of which 17.74 man-days were family supplied and 153.04 man-days were hired labour. Total cash cost for hired labor was TK. 34711 and per hectare family labour cost was estimated at Tk. 3799.5. Per hectare total material cost for aus rice production was Tk. 7743.11 and for jute production was Tk. 9648.01. The material costs include costs of seeds fertilizer, cow dung and insecticides.

The findings of the study showed that the average yields of aus rice and jute amounted to 2297.2 kg and 2758.33 kg per hectare, respectively. In monetary terms, the values were Tk. 41349.6 and Tk. 68958.25 for aus rice and jute, respectively. Thus the yield as well as the value of output per hectare for jute was higher than those of aus rice. The gross returns (including by-product) from aus rice and jute were estimated at Tk. 43322.58 and Tk. 75390.33, respectively. The average net returns per hectare over the full cost were found to be Tk. 377.51 and Tk. 11484.49 for aus rice and jute, respectively.

Partial budgeting analysis: In the present study, partial budgeting method was used among aus and jute to compare the profitability among the two crops. It implied that the jute growers benefited an amount of Tk.11108/- per hectare by producing jute than the aus growers in the same growing season (Table 5).

Functional analysis: In this study, Cobb-Douglas production function was also used to determine the effects of some important inputs on value of output from aus rice and jute. The chosen explanatory variables were human labour, power tiller, seed, fertilizer, cow dung and Insecticide.

The estimated production functions for aus rice as follows:

$Y_1 = 0.190 + 0.260\ X_1 + 0.058\ X_2 + 0.231\ X_3 + 0.352\ X_4 + 0.142\ X_5 - 0.060\ X_6$

Again, the estimated production function for jute was as follows:

$Y_2 = 1.190 + 0.324\ X_1 - 0.014\ X_2 + 0.191 X_3 + 0.352\ X_4 + 0.090\ X_5 - 0.040\ X_6$

The regression coefficient of human labor cost

Table 1. Age distribution of the respondents

Age	Aus		Jute		All	
	No.	%	No.	%	No.	%
Less than 40 years	8	27	3	10	11	18.33
40 -50years	19	63	22	70	41	68.34
50 above	3	10	5	20	8	13.33
Total	30	100	30	100	60	100

Source: Field survey, 2010

Table 2. Family size of the farmers

Categories according to family size	Aus		jute	
	No. of farmers	Percentage	No. of farmers	Percentage
Small family (0-3)	5	17	2	7
Medium family (4-5)	21	70	20	66
Large family (above 5)	4	13	8	27
Total	30	100	30	100

Source: Field survey, 2010

Table 3. Educational status of the respondents

Categories	Aus		jute		All	
	No.	%	No.	%	No.	%
Illiterate	8	27	7	23	15	25
Primary level	14	46	13	44	27	45
Secondary level	5	17	9	30	23	23
Above secondary level	3	10	1	3	4	7
Total	30	100	30	100	60	100

Source: Field survey, 2010

Table 4. Per hectare production costs and returns of aus rice and jute

Items	Aus (Tk)	% of total cost	Jute	% of total cost
Cash costs				
Human labor (hired labor)	19828	46.17	34711	54.31
Power tiller	4417.76	10.29	5188	8.12
Seed	2262.49	5.27	808.8	1.27
Fertilizers	4078.10	9.49	6677.60	10.45
Insecticides	557.58	1.3	1111.11	1.74
A. Total cash costs	31143.92	72.52	48496.51	75.89
Non cash costs				
Human labor (Family labor)	3107.5	7.24	3799.5	5.95
Cow dung	844.94	1.97	1050.50	1.64
Interest on operating capital	438.71	1.02	679.33	1.06
Land cost	7410	17.25	9880	15.46
B.Total non cash costs	11801.15	27.48	15409.33	24.11
Total cost (A+B)	42945.07	100	63905.84	100
Gross return	43322.58	-	75390.33	-
Return above cash cost	12178.66	-	26893.82	-
Return above non Cash cost	31521.43	-	59981	-
Net return	377.51	-	11484.49	-
BCR (Undiscounted)	1.008	-	1.18	-

Source: Field survey, 2010.

Table 5. Partial budgeting between aus and jute

Debit	Tk/ha	Credit	Tk/ha
Cost incurred for producing jute	63905	Cost saved for not producing aus	42945
Revenue forgone for not producing aus	43322	Revenue gained for producing jute	75390
Net change	11108		
Total	118335		118335

Table 6. Coefficient and related statistics of Cobb-Douglas production function of aus rice and jute

Explanatory variable	Aus rice			Jute		
	Estimated co-efficient	Standard errors	T- values	Estimated co-efficient	Standard errors	T- values
Constant	0.190	2.63	0.07	1.190	3.65	0.33
Human labor cost (X_1)	0.260**	0.11	2.36	0.324*	0.14	2.31
Power tiller (X_2)	0.058	0.25	0.232	-0.014	0.18	0.07
Seed cost (X_3)	0.231**	0.09	2.57	0.191**	0.09	2.12
Fertilizer cost (X_4)	0.352*	0.12	2.93	0.372*	0.17	2.18
Cost of Manure (X_5)	0.142***	0.07	2.02	0.090**	0.04	2.25
Cost of Insecticides (X_6)	-0.060	0.14	-0.43	-0.040	0.10	-0.40

Source: Field survey 2010, *** Significant at 1% level, ** Significant at 5% level and * Significant at 10% level

for aus rice was 0.260 which was significant at 5 percent level. It indicates that considering all other factors constant, one percent increase of human labor cost would increase gross return by 0.260 percent. For jute the coefficient of human labour cost was positive and significant at 5 percent level which implies that keeping all other factors constant, one percent increase in labor cost would increase gross return by 0.324 percent.

The coefficients for Power tiller were very small and insignificant for aus rice and for jute. It was indicated that power tiller cost had no significant effect on the production of aus rice and jute. The coefficients of seed cost were positive both for aus rice and jute and significant at 5 percent level which indicated that holding other factor constant, one percent increase in seed cost would increase the gross return by 0.231 and 0.191 percent for aus rice and jute respectively.

The regression coefficients of fertilizer cost were positive both for aus rice and jute and significant at 1 percent level. It indicates keeping all other factors constant, 1 percent increase in pesticide cost would increase gross return by 0.352 and 0.372 percent respectively. The regression coefficients of manure cost were positive both for aus rice and jute and significant at 10 and 5 percent level respectively. It indicates keeping all other factors constant, 1 percent increase in manure cost would increase gross return of aus rice and jute by 0.142 and 0.090 percent respectively.

It is evident from Table 6 that the values of the coefficient of multiple determinations (R^2) are 0.76 and 0.82 for aus rice and jute which mean that the explanatory variables included in the model explained 76 and 82 percent of the variation of aus rice and jute production respectively. Estimated values of the relevant co-efficient revealed that among the included variables cost of human labor, fertilizer, manure and insecticide had significant impact on the output of both crops; aus rice and jute. Power tiller and insecticides costs had insignificant impact on the per hectare output of both crops; aus rice and jute production. Returns to scale indicated that, there is possibility to increase the productivity of both the aus and jute by intensive intercultural operations (Table 6).

The study also identified the problems and constraints of aus rice and jute production. Some major problems faced by the farmers were problems of seed purity, insufficient water availability for jute washing, lack of irrigation facility for aus rice, higher input cost, storage facilities etc.

CONCLUSION

It was observed in the study area that, aus rice and jute production was profitable. However, jute production was more profitable than aus rice production. Both aus rice and jute are labour intensive enterprises. So cultivation of jute can help in increasing income and employment opportunity of the people. The management practices of aus rice and jute enterprises in the study area were not found efficient enough. Farmers were not known about the application of inputs in right time with right doses. Consequently, they made over or under use of some inputs. It was observed that most of the included variables had significant impact on aus rice and jute production. Among the included variables, four variables in the model had positive impact on returns from both aus rice and jute production. There was a scope of utilizing more fertilizers on both aus rice and jute production and thus the production would be increased. According to the famers problems, they need goals, resource and a well planned management training, so that the farmers can lead to viable production practices and sustainable income from aus rice and jute cultivation. Considering the major findings of the study, some important policy considerations arises as lack of washing water for jute is the main problem of the farmers in the study area. To minimize this problem government should take a step to dig canal or community based ponds. So those farmers can get available water for washing jute. Low and fluctuation of aus rice and jute price are the main problem of the farmers. Government can determine the floor price of rice and jute which may protect farmers from loss. Due to the lack of cash and the lack of storage facility, farmers were compelled to sell a major part of their produce immediately after harvest. Government can provide loan to the famers with low interest rate and construct store house which may provide an additional opportunity to the farmers during off season by enabling them to get a reasonable price.

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