

Financial Profitability of Aromatic Rice Production in Some Selected Areas of Bangladesh

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ABSTRACT: This study was undertaken to assess the financial profitability of aromatic rice production. A total of 45 farmers of some selected villages of Chirirbandar upazila of Dinajpur district were considered as sample for achieving these objectives. To collect data, a questionnaire was administered through face-to-face interviews of the sample farmers. Collected data were analyzed with descriptive statistics. The result of descriptive analysis revealed that the average family size of aromatic rice growers was 4.64 and 88.88 percent of total sample farmers were literate. Total costs for aromatic rice was estimated at Tk. 64446.51 per hectare and per hectare gross return of aromatic rice was Tk. 114243.71. Gross margin for aromatic rice was estimated at Tk. 59999.29 per hectare. Thus, the net return was estimated at Tk. 49797.20 for aromatic rice production. The undiscounted Benefit Cost Ratio on the basis of total cost was 1.77 implying that the aromatic rice production was highly profitable. Finally, some policy recommendations based on the findings of the study were suggested in the study.

KEYWORDS: Aromatic rice, Production, Profitability, Financial analysis.

1 BACKGROUND OF THE STUDY

Rice is the most important food crop of the developing world and the staple food of more than half of the world's population. More than 3.5 billion people depend on rice for more than 20% of their daily calories. Rice provides 19% of global human per capita energy and 13% of per capita protein in 2009 and Asia accounts for 90% of global rice consumption, and total rice demand there continues to rise. Although rice is consumed in the countries where it is produced, a growing demand in some areas is the international rice trade. In international rice trade, a relatively small number of exporting countries must interact with a large number of importing countries. In the first decade of the 2000s, the top five exporters had 81% of the world market (up from 69% in the 1960s) and since the 1980s, Thailand has consistently been the world's largest exporter of rice, followed by Vietnam and India. The volume of international rice trade has increased almost fourfold, from 7.5 million tonnes annually in the 1960s to an average of 28.5 million tonnes during 2000–2009 (ricepedia.org). In rice, aroma or scent is an inherent characteristic. In more scented rice varieties, it is apparent when the grains are smelled even when raw. Again in lesser scented varieties, only cooking releases the aroma. Aromatic rice attracts premium prices because it is highly valued by consumers, who use it for special purposes like feasts and religious occasions, like Eid, Puja, wedding ceremony, and so on. Most of the aromatic rice varieties are grown in the Aman season, although quite a few are also grown in the Boro season. The average area devoted to aromatic rice production in the T. Aman season was 12.5%, with an average yield of 2.0 tons/ha and the resultant total production of 1.42 million metric tons (Islam *et al.* 1996). A comprehensive survey conducted by the DAE in all the districts revealed that total area devoted to aromatic rice production in Aman and Boro

seasons of 2003-04 was 118 thousand hectares, with a total production of 173 thousand metric tons of rice only (DAE, 2004). For the year 2002-03, total area and production of the rice varieties were 121 thousand hectares and 180 thousand metric tons respectively. Total area and production were 118 thousand hectares and 173 thousand metric tons respectively in 2003-04. In respect of production of aromatic rice, Dinajpur, Naogaon, Chittagong and Sherpur had 1st, 2nd, 3rd and 4th position respectively in 2002-03 (Talukder, 2004). The demand for coarse and medium rice is much higher in the country. During the seventies and eighties, most of the rice varieties developed in the country fell in the coarse/medium categories. During the nineties, Bangladesh Rice Research Institute (BRRI) developed quite a good number of fine and aromatic varieties which have high demand in both domestic and foreign markets. In near future, Bangladesh is likely to become a rice exporter if the country can maintain growth in rice production as it has been doing in the past several years. Bangladeshi fine quality and aromatic rice could find significant markets both at home and abroad. In Bangladesh, The very thought of rice exports evokes mixed feelings and sentiments. While so many prospects are in sight, achievement of the goal is associated with a number of production, marketing and trade related problems. Thus, it would be pertinent to examine the relevant issues for assessing the prospect of production of aromatic rice in Bangladesh.

2 MATERIAL AND METHODS

2.1 SELECTION OF THE VARIETIES

Almost all common varieties of aromatic rice such as Kataribhog, Kalijira, Chinigura, Badshabhog and Randhunipagol were included in the study because aromatic rice growers hardly consider the varieties and almost all farmers produce at least two or three varieties of aromatic rice.

2.2 SELECTION OF THE STUDY AREA

The areas were selected from Chirirbandar upazila of Dinajpur district. The study was conducted in the villages namely Borogram, Bosontopur, Indrapara, Krisnopur and Majhina.

2.3 SELECTION OF THE SAMPLES

In order to fairly spread the sample over the entire study population at first a list of 114 aromatic rice farmers were prepared, then categorized according to their farm size, that is marginal (land holdings 0.20 ha to 0.40 ha), small (land holdings 0.41 ha to 1.01 ha), medium and large farms (land holdings 1.02 ha to above ha). This category of farm size was similar with Kazal *et al.* (2013). Based on this criterion in the study area among total 114 farms 42, 56 and 16 were the marginal, small, medium and large farms, respectively. 45 aromatic rice farms were selected from 114 farms by using stratified sampling method, by the ratio of the observation, that's why 17, 22 and 6 were marginal, small, medium and large farms respectively according to land holdings.

2.4 PERIOD OF DATA COLLECTION

Data were collected by the researcher herself in the month of February to April 2014 covering the crop year 2013.

2.5 PREPARATION OF QUESTIONNAIRE

Before preparing the questionnaire a draft questionnaire was prepared. The draft questionnaire was pre-tested by interviewing some farmers who cultivated aromatic rice. Then it was rearranged and modified carefully to identify the laps and omissions and after that required correction was made.

2.6 COLLECTION OF DATA

Primary data were collected by direct interview with a set of interview schedules designed for the research. The researcher herself conducted the whole survey. Before initiating the actual interview, each respondent was given a brief description about the nature and purpose of the study and the researcher assured the confidentiality of the information. After that, questions were asked sequentially in simple terms and explained where it was felt necessary and the replies were recorded on the questionnaire. After completing each interview, the schedule was checked and verified to be sure that all answers to each item listed in it. If any data appeared to be inconsistent, the farmer was again asked. For easy comprehension of farmers, data were collected in local units which were converted into standard units later.

2.7 PROCESSING, TABULATION AND ANALYSIS OF DATA

Tabular technique was used to analyze the data.

2.7.1 TABULAR TECHNIQUE

Tabular technique is used to find out the crude association or variations between variables. By using arithmetic means and percentages, different costs, gross margins and net profit were calculated in a tabular form.

PROCEDURE OF COMPUTATION OF COST AND RETURNS

The cost items in production of aromatic rice were classified under the following heads:

Variable costs:

- a) Cost of human labor
- b) Cost of hiring power tiller
- c) Cost of seeds
- d) Cost of fertilizer
- e) Cost of irrigation
- f) Cost of insecticide
- g) Interest on operating capital

Fixed costs:

- a) Land use cost

3 RESULTS AND DISCUSSION

3.1 SOCIOECONOMIC CHARACTERISTICS OF THE SAMPLE FARMERS

3.1.1 FAMILY SIZE, SEX AND AGE DISTRIBUTION OF SAMPLE FARMERS

The average size of family consisted of 4.64 of which 2.67 were male and 1.98 were female for all farmers. Thus, the average family size of the sample farms was higher than the national average of 4.53 (HIES, 2010). The family members of the respective farmers were classified into three groups i.e. (i) 0 to 14 years, (ii) 15 to 64 years and (iii) above 64 years (HIES, 2010). It was observed that 16.27, 77.03, 6.69 percent of the total members of the family of aromatic rice growers belonged to below 14 years, 15 to 64 years and above 64 years, respectively. Thus, the majority of family members in all the farm categories were in the working age group 15 to 64 years.

3.1.2 EDUCATIONAL STATUS

It was observed that 11.12 percent family members of aromatic rice growers were illiterate, 22.22 percent had primary education, 31.11 percent had secondary level, 26.67 percent had higher secondary level and 8.89 percent had graduation and above level of education. This data indicated that majority of the family members were in secondary level education. This literacy rate for the family members of aromatic rice growers was even higher than the national level, where the statistics of literacy is claimed to be 57.51 percent (HIES, 2010).

3.1.3 OCCUPATION STATUS OF THE AROMATIC RICE FARMERS

It was found that 75.55, 6.67, and 6.67 percent family members of aromatic rice farmers were engaged in agriculture, business and service, respectively as their main occupation. About 35.29 percent of aromatic rice growers were engaged in agriculture as their subsidiary occupation.

3.1.4 DISTRIBUTION OF FARMS OF AROMATIC RICE GROWERS ACCORDING TO SIZE FOR DIFFERENT CATEGORIES

Farm size is very important for optimal resource allocation. It is computed by adding the area rented and mortgaged/leased-in from others and deducting the area rented and mortgaged/leased-out to others. Therefore, farm size can be measured by using the following formula:

Land holding = Own land (homestead + pond + garden + farm area + cultivated land) + Rented/Leased/Mortgaged-in – Rented/Leased/Mortgaged-out (Nasrin, 2013).

In this study, the farmers were classified into four categories on the basis of farm size. Farmers having 0.20 to 0.40 hectare of land were included in the group of marginal farmers. Again having 0.41 to 1.01, 1.02 and above hectare of land is categorized as small, medium and large farmer, respectively. It was noticed that 37.78 percent of aromatic rice growers belonged to the category of marginal farmers, 48.89 percent were small farmers and remaining 13.33 percent were medium and large farmers. It also found that total farm size for marginal, small, medium and large were 0.28, 0.63 and 1.07, respectively.

3.1.5 AVERAGE FARM SIZE OF THE SAMPLE FARMERS

Average total land were 0.39, 0.79 and 1.34 hectare for marginal, small, medium and large farmers.

3.2 COSTS AND RETURNS OF AROMATIC RICE PRODUCTION

3.2.1 ESTIMATION OF VARIABLE COST

Variable costs are incurred because of the costs of using the variable inputs. These costs vary with the level of production.

3.2.1.1 COST OF HUMAN LABOR

Human labor is the most important and largely used input for any production process. It is required for different operations i.e. land preparation, sowing and transplanting, weeding, application of fertilizer, insecticide application, harvesting and carrying, threshing, cleaning, drying, storing etc. In producing aromatic rice all these operation were done by human labor and it was computed in terms of man days.

Table 3.2.1: Per hectare operation-wise human labor cost in aromatic rice

Operations	Total cost(Tk./ha)	% of total cost
Land preparation	2750.10	8.35
Sowing/Transplantation	10500.05	31.87
Weeding	7500.32	22.77
Applying fertilizer	1250.06	3.79
Applying irrigation water and insecticides	1950.02	5.92
Harvesting and others	8991.01	27.29
Total cost	32941.56	100.00

Source: Field survey, 2014.

3.2.1.2 COST OF POWER TILLER

Farm mechanization made tremendous progress and hundred percent farmers used power tiller for tillage operation in the study area. The power tiller owner supplies fuel as well as a driver for land preparation. Per hectare cost of power tiller for aromatic rice was Tk. 5321.41, which constituted 26.29 percent of the total material input cost.

3.2.1.3 COST OF SEED

Seed is the most important input for any crop production. Per hectare total cost of seed for aromatic rice were calculated Tk. 2576.74, which constituted 12.73, percent of the total material input cost.

3.2.1.4 COST OF FERTILIZER

Farmers had to spend Tk. 6723.70 per hectare for chemical fertilizer and manure. Cost of fertilizer covered 33.21 percent of the material input cost for aromatic rice. Urea, TSP, MP, DAP, Gypsum and manure covered 7.50, 9.00, 6.52, 4.26, 0.53, 5.41 percent of the material input cost respectively.

3.2.1.5 IRRIGATION COST

As aromatic rice were produced in Aman season mainly, irrigation was not so much necessary. But for some plots, rainfall was not sufficient. The total cost of irrigation was 4988.68 and it constituted 24.65 percent of the total material input cost of aromatic rice production.

3.2.1.6 COST OF INSECTICIDES

Farmers use different kinds of insecticide to keep their crop from the attack of pests and diseases. But aromatic rice growers used little insecticide. The cost of insecticides was calculated according to the amount of money which the farmers actually paid for aromatic rice production and it was Tk. 629.77 which constituted 3.11 percent of the total material input cost.

3.2.1.7 INTEREST ON OPERATING CAPITAL

Interest on operating capital includes variable costs in the production of aromatic rice which was calculated for a crop period of 4 months. Interest rate of 12 percent per annum was considered for calculation. It was calculated using the following formula:

$$\text{Interest on operating capital} = AI \times i \times t$$

Thus, interest on operating capital for aromatic rice was Tk. 1062.57

Table 3.2.2: Per hectare cost of material inputs for aromatic rice production

Item of cost	Total Cost	% of total cost
Seeds/Seedlings	2576.74	12.73
Power tiller	5321.41	26.29
Fertilizer		
Urea	1517.16	7.50
TSP	1821.14	9.00
MP	1319.92	6.52
DAP	863.25	4.26
Gypsum	107.89	0.53
Manure	1094.35	5.41
Total fertilizer cost	6723.70	33.21
Total irrigation cost	4988.68	24.65
Insecticides	629.77	3.11
Total	20240.31	100

Source: Field survey, 2014.

3.2.2 FIXED COST

Fixed costs are those costs which do not change in magnitude as the amount of output changes and are incurred even when production is not undertaken.

3.2.2.1 LAND USE COST

In the study area, most of the farmers had own land for producing aromatic rice.

Land use cost was a fixed cost for the producers. Average per hectare rental value of land was 10202.09.

3.2.3 GROSS COST

Gross cost was calculated by adding all costs incurred for variable inputs and fixed inputs for aromatic rice growers. The gross cost of aromatic rice growers was Tk. 64446.51.

3.2.4 GROSS MARGIN

Gross margin is the difference between total variable cost and total return. Gross margin of the enterprise was obtained by deducting total variable cost from total return i.e., $\text{Gross margin} = (\text{Gross return} - \text{Variable cost})$. Gross margin can be increased if the total returns increased. In the study area gross margin for aromatic rice was estimated at Tk. 59999.29 hectare (Table 6.4).

3.2.5 GROSS RETURN

Gross returns were calculated by multiplying the total amount of product and by-product with their respective farm gate prices. Per hectare average value of byproduct was estimated at Tk. 5044.51. Thus, the average per hectare gross return of aromatic rice was Tk.114243.71.

Table 3.2.3: Per hectare gross returns from aromatic rice

Crop name	Main product			Value of by product (Tk./ha)	Gross return (Tk./ha)
	Quantity (kg/ha)	Price (Tk./kg)	Value (Tk./ha)		
Aromatic rice	2729.98	40	109199.2	5044.51	114243.71

Source: Field survey, 2014.

3.2.6 NET RETURN

Net return is a useful tool to evaluate the enterprise profitability. It was calculated by deducting total cost from total return i.e., $\text{Net return} = \text{Total return} - \text{Total production cost}$. Per hectare, total costs for aromatic rice was Tk. 84850.69. Per hectare gross return of aromatic rice was Tk. 114243.71. Per hectare net return was estimated at Tk.49797.20.

3.2.7 BENEFIT COST RATIO (BCR)

Benefit cost ratio (BCR) was calculated by dividing gross return by gross cost. It is a measure to see the efficiency of resource use. Table 6.4 shows that BCR(undiscounted) was estimated 1.77 implying that TK. 1.77 would be earned by investing every Tk. 1.00 in aromatic rice production. This result is similar with Anik (2003) and Nasrin (2013).

Table 3.2.4: Per hectare production cost and returns of aromatic rice

Particulars	Value (Tk./ha)
A. Gross return	114243.71
Variable cost	
Human labor	32941.56
Power tiller	5321.41
Seed	2576.74
Irrigation	4988.68
Fertilizer	6723.71
Insecticides	629.76
Interest on operating capital	1062.57
B. Total variable cost	54244.42
C. Fixed cost	
Land use cost	10202.09
D. Gross cost(B+C)	64446.51
E. Gross margin(A-B)	59999.29
F. Net return(A-D)	49797.20
H. Benefit cost ratio (A/D) (undiscounted)	1.77

Source: Field survey, 2014.

4 CONCLUSION

Rice is the staple food of about 135 million people of Bangladesh and it provides nearly 48% of rural employment, about two-third of total calorie supply and about one-half of the total protein in-take of an average person in the country (www.knowledgebank-brrri.org). It was evident that aromatic rice is a profitable farming venture. The income potential is higher in aromatic rice cultivation, because such rice cultivation does not generally require additional expenditure on fertilizer, pesticides and irrigation and gross return from this cultivation is much higher as the product price is higher than any other rice varieties. It may be mentioned here that aromatic rice is closely related to social and cultural heritage of Bangles and it consumes during different festivals, special events such weddings, entertaining guests, Eid, Puja etc.

4.1 POLICY RECOMMENDATIONS BASED ON RESEARCH FINDINGS

Aromatic rice has more potentiality of profit in domestic market as well as in the international market. From the results of the present study, it could be noticed that production of aromatic rice was profitable for farmers. The study, therefore, suggests taking adequate measures by the policy makers to expand the production of aromatic rice. On the basis of the present study, the following recommendations may be advanced for improving production of aromatic rice:

- The policy makers need to maintain the price of fertilizer, seeds and other inputs within the reach of the farmer.
- Various government and non-government research institutions should strengthen their human resources for rice research and to address the issues of low yield, seed production, lodging of plants, loss of aroma of aromatic rice;
- The policy makers need to stabilize the price of aromatic rice to support the aromatic rice growers;
- Government may provide short term training programs for better management practices of aromatic rice production.

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