J. Fac. Appl. Biol. Sci.,
Hiroshima Univ. (1996), **35**: 221~234

Costs and Returns of HYV Boro Paddy with Reference to Resource Use in an Area of Mymensing District in Bangladesh

Akbar MOHAMMAD ALI and Osamu SAITO

Faculty of Applied Biological Science, Hiroshima University,
Higashi-Hiroshima 739, Japan

Received October 31, 1996

Abstract The present study is conducted in boro paddy growing village named *chulkai* under Mymensing district. The present study is an endeavour to know the following specific objective: (a) to identify some general features of the farm and farm family (b) to compute the costs and returns of the HYV boro paddy of 1995 (c) to identify the problems faced by farmers in production and markeitng. The result of the study shows that the benefit-cost ratio for boro paddy is 1.6 which implied that the cultivation of boro paddy offered inducement of the farmers. The study also indicate that small farmers face acute problems offer fertilizer and institutional credit. The study also point out the inefficiency of government procurement system, unsatisfactory conditions of rural markets, multiplicity of weights and measures, lack of market information, poor transportation system which are very fundamental problems in respect of boro marketing in study area.

Key words: Boro paddy, cost-return, Bangladesh

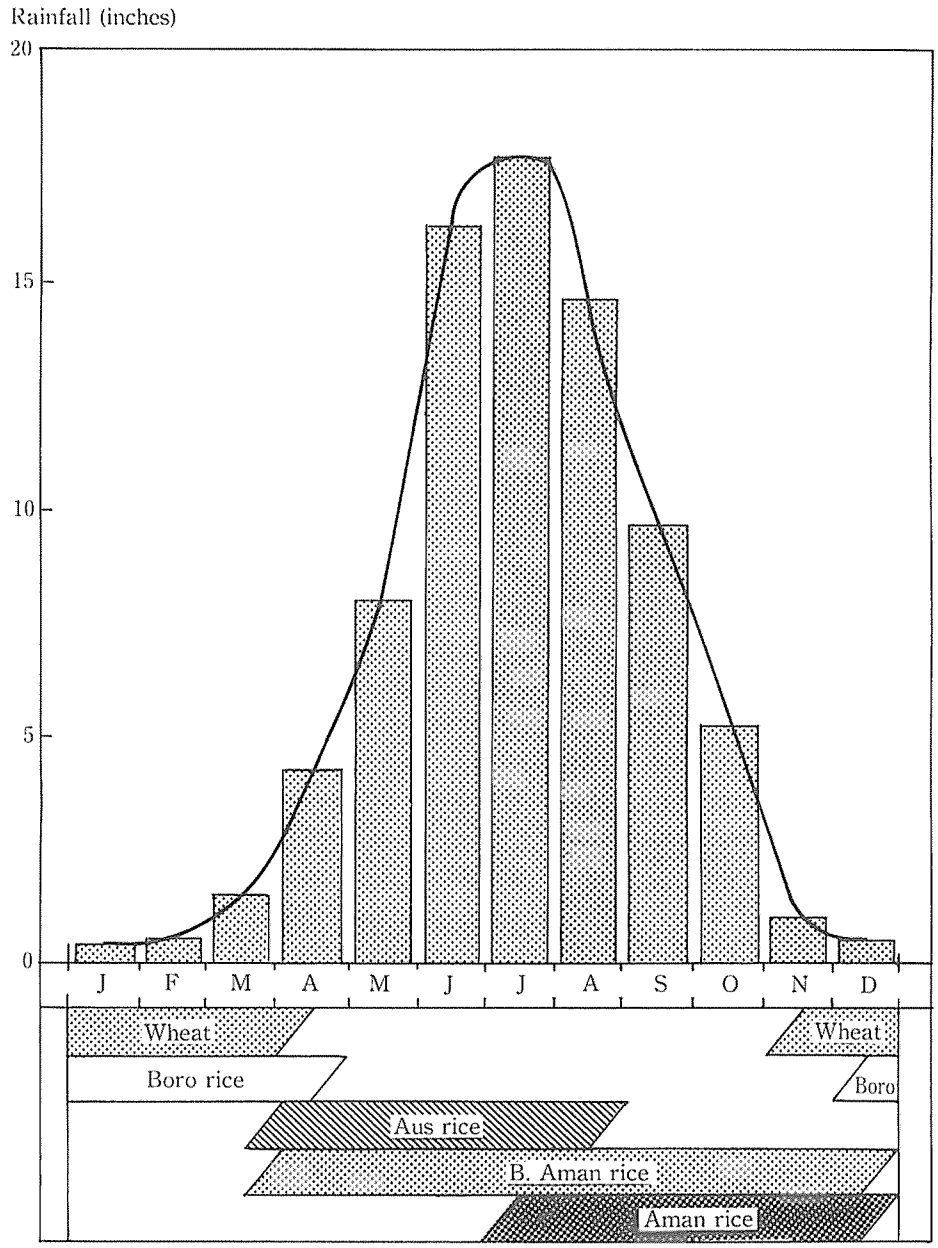
INTRODUCTION

Rice is by far the most important food crop which covered 74.36% area of the total cropped area contributing 81.61% of the total foodgrain in 1990–91 (BBS, 1992) and it is the major energy source which supplies 93.84% calorie of the total intake cereals and it also supply about 90% protein of the total cereals (Mc DIVITT & MADAMBI, 1973). There are three varieties of rice grown which are locally known as *Aus*, *Aman*, and *Boro*. These three varieties of rice are grown and harvested in differnt periods of the year and vary in terms of quality. Aman is the predominent type of rice crop followed by aus and boro. There are two types of aman which are broadcast (deep water paddy) and transplanted and be categorised as either local or high yielding varieties. Aus and boro also comprised of local and high yielding varieties. Monthly rainfall, transplanting and harvesting periods of all varietiesof paddy are shown in **Appendix A, Fig. 1**. However, this paper summarizes findings of a survey conducted to obtain insights into the structure of costs and rates of return from boro paddy cultivation in an area of Mymensing district in 1995.

SURVEY SITE PROFILE

Area of location

The village *Chulkai* is belong to the union of Boilor under Mymensing district. My-



Appendix A, Fig. 1: Mean monthly rainfall distribution and the rice seasons in Bangladesh. Source: BBS

mensing has long been a rice surplus districts and has supplied paddy and rice to the capital Dhaka. The study village is progressive in the sense that the people are more exposed to communication facilities, very near to Mymensing district, have electricity, primary and secondary school within the village. Moreover, it is an old project village of Bangladesh Agricultural University. The main criteria behind the selection of the study area are as follows:

(1) farmers have been cultivating HYV boro paddy since 1970
(2) Bangladesh Agricultural University is very near to the village so adoption of modern practices are very much dominant in this village.

Physical feature and topography

The land surface of the study area is almost plain. The study village is high enough to remain unaffected by flood. Soil of the area varies from sandy to clay loam. The water holding capacity of the soil is normal. Major crops grown in this village are -rice, jute, potato, mustard. Boro-Fallow and Mixed Aus and Broadcasting Aman-Rabi crops are the two principal cropping patterns followed in this village.

The climate condition of the study area is considered not to be different from that of other parts of Mymensing district as a whole is quite favorable for the production of paddy. The summer season begins with strong west wings in the first week of March and continues till middle of June. The summer is very hot and sometimes intolerable when the air becomes extremely dry. The monsoon generally starts from the middle of June and continues upto the end of September. From the middle of October, night becomes considerably cooler. The winter starts from early November and continues till end of February. The annual rainfall is 2364 mm, humidity 70−85%.

Occupation of the people

The main occupation of the villagers of the area is cultivation. Persons in business, trade, govenment services or other professions are a very negligible percentage of population. Unlike other areas of the country, the pressure of population on land is not very high and they do not like to get out of the native place even temporarily to seek other means of livelihood.

Communication facilities

The study area is well connected with the thana and district head quarters by rail and roads. People generally use rickshaws and bullock carts for transporting goods and commodities from one place to another.

RESPONDENTS PROFILE

It is impossible to conduct a farm bussiness survey covering all farms and therefore samples are chosen. The design of the sampling was startified random sampling to fulfill the objectives of the study. 50 farms of different farm size were selected for the present study. The main occupation of the sample farmers is farming. In addition to this occupation, 11 farmers i.e. 22% of the sample farmers are engaged in business and service.

In the present study farm size has been defined as the cultivated area which is consisted of total acres owned plus acres rented in and mortgaged in minus rented out and mortgaged out. Farmers are classified into three groups such as small, medium and large according to their size of holding 0.02 to 1 hectors, 1.01 to 3.30 hectors and above 3.03 hectors. **Appendix A, Table 1** shows that 68% cultivated upto 1 hectors, 24% cultivated between 1.01 to 3.03 hectors and 8% cultiveted more than 3.03 hectors.

Appendix A, Table 1 Classification of Sample Farmers by Farm Size

Size of Farm	Number of Farmers	Percentage of the Total Farmers
Small (0.02−1.008) hectres	34	68
Medium (1.01−3.03) hectres	12	24
Large (3.03 hectres above)	04	08
All Sizes	50	100

Appendix A, Table 2 Overall Land Utilization Pattern of Sampling Farmers

Farm Size (Hectare)	No. of Farms	Household (Hectares)		Rice Field (Hectares)		Orchard (Hectares)		pond (Hectares)		Others (Hectares)	
		T. Area	Average	T. Area	Average	T. Area	Average	T. Area	Average	T. Area	Average
Small (0.01−1.008)	34	1.521	0.044	9.147	0.269	0.182	0.005	0.407	0.01	1.22	0.03
Medium (1.01−3.03)	12	1.21	0.101	11.34	0.945	0.688	0.05	0.607	0.05	1.741	0.145
Large (3.03 above)	04	0.675	0.168	9.99	2.497	0.641	0.160	0.675	0.168	1.856	0.460
All Size	50	3.406 (8.128)	0.068	30.477 (72.73)	0.609	1.51 (3.60)	0.03	1.689 (4.03)	0.033	4.817 (11.49)	0.096

Figures within Parentheses Indicate the Percetage.

Appendix A, Table 3 Per Hectare Paddy Production by Differnt Farm Size

Farm Size	No. of Farms	Total Hectare under Paddy	Avarage Hectare under Paddy	Total Production *(md)	Production per Hectare (md)
Small	34	9.147	0.269	1364	149.11
Medium	12	11.34	0.945	1843	162.52
Large	04	9.99	2.497	1674	167.56
All Size	50	30.477	0.609	4881	160.15

*1 Maund=39.5kg

Overall land utilization pattern of sample farmers is shown in **Appendix A, Table 2.** About 8% is household, 72.73% is rice field, 3.6% is orchard, 4% is pond and others is 11.49%. Per hector paddy production by different farm size is presented in the **Appendix A, Table 3.** According this table, per hector production of boro paddy by small, medium and large and average are 149.11mon/ha, 162.52mon/ha, 167.56mon/ha, 160.15mon/ha respectively.

OBJECTIVES OF THE STUDY

The present study has been designed with the following objectives

1. To identify some general features of the farms and farm family
2. To compute the costs and returns of the HYV boro paddy in 1995.
3. To identify the problems faced by farmers in production and markeitng

Appendix B, Table 4 Avarage Per Hectare Cost of Production (Boro Paddy) by Differnt Farm size

Cost Item	Per Hectre Avarage cost (Small Farm)	Percentage of the Total cost	Per Hectre Avarage cost (Medium Farm)	Percentage of the Total cost	Per Hectre Avarage cost (Large Farm)	Percentage of the Total cost
Human Labour	*T.K. 8324.07	35.21	T.K. 8666.66	34.32	T.K. 8666.66	32.99
Animal Labour	T.K. 1814.81	7.67	T.K. 1870.37	7.40	T.K. 1925.92	7.33
Seed/Seedling	T.K. 1780.07	7.53	T.K. 1987.48	7.87	T.K. 1995.92	7.59
Fertilizer	T.K. 2780.81	11.76	T.K. 3039.40	12.03	T.K. 3247.55	12.36
Manure	T.K. 384.44	1.62	T.K. 555.55	2.20	T.K. 599.92	2.28
Insecticides	T.K. 594.44	2.51	T.K. 744.04	2.04	T.K. 892.29	3.39
Irrigation	T.K. 4225.92	17.87	T.K. 4888.88	19.30	T.K. 5185.18	19.73
Interest in Oparating Capital	T.K. 234.01	1.00	T.K. 252.59	1.00	T.K. 260.10	1.00
Interest on Land Value	T.K. 3497.00	14.79	T.K. 3497.00	13.84	T.K. 3497.00	13.31
Total	T.K.23635.57	100	T.K.25249.41	100	T.K.26270.54	100

Appendix B, Table 4.1 Avarage per Hectare Cost of Production (Boro Paddy)

Cost Items	Avarage cost per Hactare (Taka)	Percent of Total Cost
Human Labour	8552.46	34.17
Animal Labour	1870.36	7.47
Seed/Seedling	1921.15	7.66
Fertilizer	3022.58	12.05
Manure	513.30	2.03
Insecticides	743.59	2.64
Irrigation	4766.66	18.97
Interest in Oparating Capital	248.9	1.00
Interest on Land Value	3497.00	13.98
Total	25051.84	100

Appendix B, Table 5 Per Hectare Human Labour Cost in Producing Boro Paddy by Differnt Farm size

Items	Small Farm		Medium Fram		Large Farm		Avarage	
	hrs/ha	*T.K/ha	hrs/ha	T.K/ha	hrs/ha	T.K/ha	hrs/ha	T.K/ha
Land Preparation	273	1248.60 (15)	321	1473.33 (17)	340	1559.99 (18)	311	1427.30 (16.67)
Transplanting	345	1581.57 (19)	340	1559.99 (18)	340	1559.99 (18)	341	1567.18 (18.33)
Weeding	200	915.65 (11)	202	1386.66 (16)	227	1039.99 (12)	243	1114.10 (13)
Fertilization	55	249.72 (3)	76	346.66 (4)	38	173.33 (2)	56.3	256.57 (3)
Irrigation	290	1331.85 (16)	161	736.66 (8.5)	227	1039.99 (12)	226	1036.16 (12.16)
Insecticiding	2	8.34 (0.10)	94	433.33 (5)	19	86.66 (1)	38.33	176.11 (2.03)
Harvesting	254	1165.36 (14)	208	953.30 (11)	246	1126.66 (13)	246	1081.77 (12.67)
Carrying	200	915.65 (11)	208	953.31 (11)	246	1126.65 (13)	218	998.56 (11.67)
Threshing	198	907.33 (10.9)	179	823.32 (9.5)	208	953.33 (11)	195	894.66 (10.47)
Total	1815	8324.07 (100)	1890	8666.66 (100)	1890	8666.66 (100)	1875	85524.46 (100)

Figure with in Parenthesis Indicate the Percentage.

Appendix B, Table 6 Per Hectare Animal Labour Cost of Producing Boro Paddy by Differnt Farm Size

Items	Small Farm		Medium Fram		Large Farm		Avarage	
	hrs/ha	T.K/ha	hrs/ha	T.K/ha	hrs/ha	T.K/ha	hrs/ha	T.K/ha
Land Preparation	273	1252.21 (69)	269	1234.45 (66)	252	1155.55 (60)	265	1214.07 (65)
Threshing	123	562.59 (31)	139	635.92 (34)	168	770.36 (40)	143	656.29 (35)
Total	396	1814.81 (100)	408	1870.37 (100)	420	1925.92 (100)	408	1870.36 (100)

Figure with in Parenthesis Indicate the percentage
1 T.K. = ¥3

JUSTIFICATION OF THE STUDY

With a view to bringing about self - sufficiency in food production as early as possible the government of Bangladesh have placed special emphasis on paddy production all the year round. Introduction of HYV paddy in Bangladesh is one of the measures so far adopted for incresing paddy production. It is argued by different circles that the cost of prosduction of HYV boro is increasing day by day (specially in this day of government input subsidy withdrawal policy) due to increase in the input price but output price is not increased accordingly. Therefore, the problems of the majority farmers (small farmers) are becoming more complicated. This study is designed to investigate the costs and returns of HYV boro for 1995. This study also will try to identify the problems faced by the farmers in recent years in producing HYV boro.

Therefore, the finding of the study will help the planners, policy markers in making correct decisions and formulating right policy.

COSTS AND RETURNS ANALYSIS

This section attempts at measuring the average costs and returns per hector of boro paddy in small, medium and large farm size groups. The cost consisted of human labour, animal power, material inputs such as seeds, fertilizers, manure, insecticides. In addition to these, it included interest on operating capital and interset on the land value. To calculate the value of these inputs, the going market price was considered.

Cost of human labour

Human labour consisted of family labour and hired labour. Family labour included operator himself and male and female members of the family while hired labour were employed on daily basis. Usually, hired labourers were paid in cash and sometimes they were paid on the basis of crop yields (on the case of harvesting and threshing). The cost of family labour was calclated on the basis of opportunity cost principle. For women and chidren, man equivalent hours were estimated. This was computed by converting all women and children hours into man equivalent hours by adopting a ratio of 1 male=1.5 women=2 children. For instance, when either a child or a women could equally perform the work of an adult male, no conversion was made.

Cost of human labour shared a major portion of the total variable costs in each farm size groups. The average cost of human labour was Taka 8552.46 i.e. 34.17% of the total production cost. (see **Appendix B, Table 4, 4.1 and 5**)

Cost of animal labour

The measuring unit for animal labour was called *hal* by the farmers in the study area.

One *hal* included a pair of bullock and one human labour attendant with tools and implements like plough, ladder etc., and worked for six hours a day. Cost of hired animal labour was calculated according to the rate prevailing in the study area. The rate was TK. 45 per *hal* in 1995. Cost of home supplied animal power was calculated on the basis of the opportunity cost doctrine. The per hector cost for animal power was TK. 1870.36 constitut-

ing 7.47% of the total cost. (See **Appendix B, Table 6 & 4.1**)

Cost of Seeds and Seedlings

Farmers used both home grown and purchased seeds and seedlings. Home seeds and seedlings were charged at the average market price. The costs of purchased seedlings were calculated according to the payments made. The cost of seeds was TK. 1921.15 per hector which is 7.66% of the total cost. (See **Appendix B, Table 4 & 4.1**)

Cost of Irrigation

In the study area, farmers had to depend on power pump irrigation. The share of the per hector irrigation cost is 18.97% of total cost. The share of irrigation cost of small, medium and large farm are TK. 17.87%, 19.30% and 19.73% of total cost. (See **Appendix B, Table 4 & 4.1**)

Cost of Chemical fertilizer

Three types of chemical fertilizers, namely, Urea, T.S.P. and M.P. were used by the farmers in the study area. The per hector application of Urea, T.S.P. and M.P. was 188kg, 134kg, 55kg respectively. The going market price for Urea, T.S.P. and M.P. was TK. 8.70, TK. 8.58 and TK. 6.75 per kg respectively. The per hector cost of chemical fertilizer was TK. 3022.58 i.e. 12.05% of the total cost. (See **Appendix B, Table 7, 4 & 4.1**)

Cost of Manure

On an average, the amount of manure applied to an hector of land was 3607.33kg. The price of manure was TK. 0.14 per kg. Thus the cost of manure per hector was TK. 513.3 constituting 2.03% of the total cost. (See **Appendix B, Table 7, 4 and 4.1**)

Cost of Insecticides

The insecticides used by the farmers in the study area were *Dimecron*, *Basudin*, and *Furadan*. *Carbicorn* was also used by some farmers. The farmers used to buy insecticides from the village dealers. The share of insectides to total cost were 2.51%, 2.04% and 3.3% for small, medium and large farms respectively. The per hector cost of insecticides was TK. 743.54 i.e. 2.64% of the total cost. (See **Appendix B, Table 4 and 4.1**)

Interest on Operating Capital

Operating capital includes the expenses on hired human labour, hired animal power, seed and seedlings, chemical fertilizers and insecticides. Interest on operating capital was charged at the rate of 10 percent per annum and was estimated for 3 months. The per hector interest cost on operating capital was TK. 248.9 i.e. 1 percent of the total cost. (See **Appendix B, Table 4 and 4.1**)

Interest on Value of Land

Interest on value of land was charged at the rate of 13.98 percent per annum and estimated for period of six months. The value of land was estimated through discussion

Appendix B, Table 7 Distribution of Fertilizer/Manure and The Cost There of in Producing Per Hectare Boro Paddy

Items	Small Size		Medium Size		Large Size		Avarage Size	
	Kg/ha	*T.K/ha	Kg/ha	T.K/ha	Kg/ha	T.K/ha	Kg/ha	T.K/ha
Cowdung	2702	384.44 (10.83)	3904	555.55 (15.45)	4216	599.92 (15.59)	3607.33	513.30 (14)
Urea	190	1652.09 (46.54)	181	1578.90 (43.92)	193.34	1685.96 (43.82)	188.11	1638.98 (44.73)
Tsp	133	1128.50 (31.79)	130.5	1106.88 (30.79)	139.5	1183.09 (30.75)	134.33	1139.49 (31.09)
Mp	57	384.64 (10.84)	52.5	353.74 (9.84)	56.17	378.59 (9.84)	55.22	372.32 (10.16)
Total	3082	3549.67 (100)	4268	3594.95 (100)	4605.01	3847.47 (100)	3984.99	3664.09 (100)

Figures within Parentheses Indicate Percentage
*1 T.K. = ¥3

Appendix C, Table 8 Per Hectare Returns and Benefit–Cost Ratio in Boro Paddy by Differnt Farm Size

Items	Small Size	Medium Size	Large Size	Avarage
Return from Paddy	T.K.35786.40	T.K.39004.80	T.K.40214.40	T.K.38436.00
Return from Straw	T.K. 1491.00	T.K. 1625.20	T.K. 1675.60	T.K. 1601.50
Gross Returns	T.K.37277.40	T.K.40630.00	T.K.41890.00	T.K. 40037.5
Production Costs	T.K.23635.57	T.K.25249.41	T.K.26270.54	T.K.25051.84
Net Return*	T.K.13641.83	T.K.15380.59	T.K.15619.46	T.K.14985.66
Benefit–Cost Ratio**	1.58	1.61	1.59	1.60

*Gross Returns Less Total Production Cost.
**Gross Returns Devided by Production Cost.

with the farmers as well as taking into consideration the market price in the study area which varied from plot to plot depending upon location and soil fertility. The share of interest on the land value was TK. 3497 i.e. 13.98 percent of the total cost. (See **Appendix B, Table 4 and 4.1**)

Total Cost of production

The per hector total cost of boro paddy production was calculated by adding all implicit expenses. The average per hector total cost was estimated to be TK. 25051.84 (See **Appendix B, Table 4.1**)

Gross Return

The average gross returns per hector boro paddy were calculated by adding the value of paddy production per hector and the value of straw raised from that hector. The per hector production of paddy was 160.15 maunds and the prevailing market price was TK. 240 per maund one to two weeks after harvest. The per hector return from straw was 160.15 maunds and the price was TK. 10 per maund. On an average, the estimated amount of gross return for boro paddy was TK. 40037.50 per hector (See **Appendix C, Table 8**)

Net Return

The net return of boro paddy was estimated by deducting the total cost of production from the gross returns. The per hector net return for boro paddy was TK. 14985.66 (See **Appendix C, Table 8**)

Benefit Cost Ratio

Benefit-cost ratio is the ratio of gross returns to total costs. The benefit-cost ratio for boro paddy was 1.60 which roughly implies that the cultivation of this paddy in the study area offered inducement to the farmers. (See **Appendix C, Table 8**)

PROBLEMS FACED BY FARMERS

The purpose of this section is to provide the problems which are faced by farmers in paddy production and marketing.

(1) Problems in Production

Fertilizer problems: Attempts were made at ascertaining the extent of problems faced by the farmers in using fertilizers and credit. All the sample farms were interviewed to state the problems they faced in the use of chemical fertilizers and credit (institutional). Most of the farmers narrated several problems and corruption by the dealers. According to their opinion, the dealers were mainly responsible for these problems and corruption.

The majority of the farmers reported that they did not get the fertilizers in time and what they got was of insufficient quantities. They had to purchase fertilizers in black market paying higher prices. The dealers usually claimed higher price than what was fixed by the government otherwise they did not sell fertilizers to them. Therefore, the farmers getting no alternatives had to pay higher prices for fertilizers. Some of the farmers even

did not know what the fixed price were. On the contrary, the dealers when asked why they were charging higher prices, they replied that they had to make some invisible payments to the officers concerned and thus for covering these costs they had to charge a little higher prices. However, the distribution of fertilizers showed favouritism to the relatives, friends and other influential faces. As a result farmers were deprived of government proposed subsidies to a great extent. The farmers also complained of the defective weighing system adopted by the dealers who purposefully avoided the use of the metric system. Besides these, a number of farmers informed that they could not purchase the fertilizers in time due to cash shortage.

Credit problems: Farmers using credit had hopes of obtaining institutional credit but many of them failed, particularly the landless poor and the small farmers faced the regid institutional difficulties in gaining access to the benefits being distributed by the commercial banks. The banks followed rigid lending practices and particulrly their insistence on security made it almost imposible for the poorer farmers to obtain financial support for operating their farming business.

(2) Marketing problems

Different units of measurement: One of the interesting feature of the study area is the variations of measurement units used by *faria* and *bepari* (maket functionaries). Besides, the units of weight used when purchasing and selling are often different in the same place. *Tola*, *chatak*, *seer* and *maund* are the weight units commonly used in Bangladesh. The standard conversion of these units as follows; five *tolas* make one *chatak*, 16 *chatak* make one *seer* and 40 *seers* make one *maund*. A standard *seer* is 80 *tola* or 933 grams. A local *seer* which is common in the study area used by *faria* and *bepari* is 85 *tolas* when buy the paddy from farmers and that in *aratdar* or miller is 80 *tolas* when he sell the paddy. Farmers know well the difference between weight units for sale and purchase, but it seems that they take it as granted because the volume of paddy of small and marginal farmers in not so large that they can bypass the *faria* and *bepari* and to sell the *aratdar* (local wholesaler).

Procurement problems: One of the aims of government paddy and rice procurement programmes is to give incentive price to the farmers. Now, if the government wants to provide incentive price to the farmers, efforts should be made to procure paddy throughout the year but procurement operation actually takes place during the winter season.

The present procurement system does not seem to be sufficient enough in meeting the needs of the farmers. Most of the farmers are forced to sell a substantial amount of their products immediately after harvest, and are affected by seasonal price fluctuations. Not only do they sell their products at the low market price but also buy back at the high marketing price during the lean season to maintain their families.

The procurement centers are so widely scattered that the farmers find it difficult to bring their products to the centers either because of transport problems or of incurring huge transportation cost. So, the only way open to farmers is to sell their products in the open market with relatively low price. Thus, who are actually benefited from the procurement prices are intermediaties, not the farmers.

Government procurement centers buy paddy only in minimum sized lots usually a gunny bag full. But a typical small farmer with a very small piece of land can not sell his products in such an amount. His paddy processing capacity is limited and transport capability is confined to head loads. For all these reasons, the rural farmers have only small quantities available for sale on frequent occations.

Again, the government procurement centers do not make purchase immediately after harvest because of huge moisture content in the grains. But the farmers are bound to sell their products immediately after harvest because of debt repayment burdens and to meet daily necessaary expenses. Again, in the name of huge moisture content, the purchasing authorities sometimes refuse to buy from the famers, whereas grains of similar quality are purchased from the intermediaries.

The payment for the procured paddy by the government is done through W.Q.S.C. (weight quality sale certificate), which is treated as cheque. The sellers produce it to the local bank branch and get payment. Illiterate small farmers are not used to such practices. As such, on many occasions they are found to bring the paddy to the procurement centers, and sell it to the intermediaries to avoid such formalities.

Unsatisfactory conditions of rural markets: Basic facilities and amenities are lacking in the local rural market in the study area. Drainage, public facilities, like, toilet drinking water, adequate space for carts and bullocks or buffaloes carrying the crops, paved lanes and by lanes within the market are absent in most cases. The crops assembled under the open sky are damaged by the sun and rains.

The ljarder (Lease-holder) of the markets realize market toll much in excess of the prescribed rates taking advantage of the absence of any agency in the markets.

Lack of market information: In the market, there is no arrangement for dissemination of market information to the market participants. While big traders have their own information system through telephone and others means and can take correct marketing decisions to maximize their profits, the farmers and small traders suffer for lack of information on the prevailing price of their crops to bargain with the buyers. Traders in their own interest do not reveal the correct price to their sellers; they are very prompt to pass on any information which may depress the price but withhold any information which will increase the price. The responsibility for supplying correct, unbiased and timely market information to all market participants naturally devolves on government.

REFERENCES

Akter SHAHIN (1989): A quantitive analysis of marketable surplus of paddy and food policy in Bangladesh. *A ph.D dissertation*, University of London.

AHMED R and BERNARD A (1989): Rice price fluctuation and an approach to price stabilization in Bangladesh. *Research report no. 72*, International Food Policy Research Institute, Washington D.C, USA.

Abu ABDULLAH (1986): The distribution of benefits from the public food distribution system.

A.K. Maksudul BARI (1987): Food aid in Bangladesh: Its implication. *Bang.J.Agric.Econ.* X, 2 December (1987).

HAMID MA (1991): A data base on agriculture and food grains in Bangladesh. 1947–48 to 1989–90,

winrock international, Dhaka.

Hiroshi ISHIHARA (1987): Markets and marketing in rural Bangladesh. *Market and traders in South Asia*, Series No. 1.

Mahabub HOSSAIN (1980): Foodgrain production in Bangladesh: performance, potential and constraints. *Bang.J.Dev.Stu.* 8(1&2), 1980.

M.A. JABBAR (1985): Food production in Bangladesh: policy, strategy and consequences. *Bang.J.Agric.Econ* VIII, 1 (June 1985).

MURSHED SMM RAHMAN ML (1988): Marketed surplus of paddy at the farm level in Bangladesh, An analysis by casual variables of production and consumption. *Bang.J.Agric.Econ*, 11(2).

MAZIRUDDIN (1990): Agricultural marketing in Bangladesh. A consultant's report.

Nuimuddin CHOWDHURY (1992): Rice markets in Bangladesh, A study in structure, conduct and its performance. *USAID Contact No. 388-0027-C-9026-00*

Nuimuddin CHOWDHURY (1988): Farmers' participation in the paddy markets, their marketed surplus and factors affecting it in Bangladesh: A comment, *Bang.J.Dev.Stu.* Vol. XVI, March 1988.

Quazi SHAHABUDDIN (1987): Interrelationship in the public foodgrain distribution system in Bangladesh. An econometric analysis. *Bang.J.Dev.Stud* 15(1) 1987.

QUASEM MA (1989): Farmers' participation in the paddy markets, their marketed surplus and factors affecting it in Bangladesh. *Bang.J.Dev.Stu.* 15(1) 83.

R.K. TALUKDER (1987): Foodgrain pricing policies in Bangladesh: An analysis of welfare effects. *Bang.J.Agric.Econ.* X, 2 (December 1987).

バングラデシュにおける稲作高収量品種の収益性と経営発展の条件
ーマイメイシン地方のボロ作の調査研究から

Akbar MOHAMMAD ALI and Osamu SAITO

広島大学生物生産学部，東広島 739

この論文ではバングラデシュのマイメイシン地方チャルカイ村の稲作経営についてボロ作の調査分析を事例として，その収入と費用を規模との関連で把握して経営課題を整理・検討することを目的とする。分析の具体的手順として3つの点を検討した。

(1) ボロ作の農家の経営的特徴を明かにする。

(2) 高収量品種の収入と費用から収益性を把握する。

(3) 経営発展の課題として流通システムとの関連を整理する。

分析結果から収入と費用の比率は1.6であり，収益性が形成され生産者の作付拡大の意欲は高いことが明確になり，規模の大きな経営体では価格形成，集約的な技術管理において比較有利性が形成されている。他方，小規模経営体では科学肥料の確保がしにくかったり，また，借入金の利子負担が経営再生産を阻害している。さらに，流通の効率化が市場情報の欠如，輸送システムの未確立，規格・計量の不統一，他方市場の不完全性などの諸点から遅れており，このことが特に中小規模の経営体の成長を阻害している。以上から高収量品種の導入と栽培技術の確立によって生産システムが形成されても，経営発展には流通システムの比効率性，非公正などによって阻害条件が多いことが解明された。

キーワード：ボロ作，収益性，バングラデシュ