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*Research Note*

# *PROSPECTS OF BORD RATOON CROPPING 1N ALLEVIATING RURAL POVERTY IN HAOR AREAS OF BANGLADESH*

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## I. INTRODUCTION

There ate many haors and beels located mostly in the greater Sylhet-Mymensingh districts of Bangladesh. The haors and beels comprise an area of 114,163 hectares of land in the country (UNDP 1989). The characteristics of haors and beels are that they are low-lying basins and the areas stay under water for about six months of the year. Consequently, a single crop, namely boro paddy can be grown in these areas in winter season.

The economy of haor areas is significantly different from the economy of other parts of the country. The economy of these areas is highly underdeveloped due to underdeveloped agriculture. About 80 percent households of the haor areas are landless and land poor farmers ; while the remaining 20 percent farmers (medium and large) are the owners of almost 70 percent of the crop land (Matin and Talukder 1980 ; Ahmed 1987 ; Asaduzzaman 1987). Because of lack of employment and income opportunities, the level of poverty is significantly higher in these areas than other parts of Bangladesh.

Recently, the government has undertaken projects to construct embankments and sluice-gates to protect the boro crop from early flash flood. This will obviously benefit the medium and large farmers who own tha overwhelming proportion of crop land. The landless and small farmers will also be benefited because they grow boro ratoons. It should ba mentioned here that medium and large farmers do not usually grow boro ratoons in their land due to their social prestige. Because, they consider boro ratoaning as the crop of the needy people of the society.

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Boro ratoon refers to a crop which grows from the stalks left after the harvest of the main crop boro paddy. In the study areas the boro paddy is transplanted in the months of December to January. Harvesting of boro paddy starts from the beginning of April and the peak harvesting time is from mid April to the end of April. The boro ratoons which come out within a weak's time become ready for harvesting within 5-6 weeks (Hoque *et al.* 1991). Thus, the main growing period of boro ratoon falls within mid April to late May for local variety ( LV ) and within late April to early June for high yielding variety (HYV).

There are few economic studis on haor agriculture and particularly there has been no study on economic aspects of ratoon cropping and its beneficiaries. The primary objective of this paper is to measure the economic benefit of ratoon cropping and its distribution. The paper has been organized as follows. In section II, data collection and socioeconomic characteristics of sample households are described. Distribution of benefits of ratoon crops is discussed in section III. Socioeconomic constraints to ratoon cropping are mentioned in section IV, Conclusions and policy recommendations are made in section V,

## II. DATA COLLECTION AND SOCIOECONOMIC CHARACTERISTICS OF SAMPLE HOUSEHOLDS

### Study Area and Data Source

The study was carried out in three purposively selected haor areas under Sunamganj district, They were Shanghair haor located under Sunamganj Upazila, Tangua haor under Deraj Upazila and Bhanda beel under Shalla Upazila. The total land areas of three haors are respectively about 2900, 4900 and 3700 hectares. In these areas there are 68 villages but intensive practice of ratoon cropping was found in 11 villages. Among them 3 villages were in Shanghair haor, 5 in Tangua haor and the rest 3 villages in Bhanda beel. All the 11 villages were selected for the study. A list of ratoon crop farmers in the study areas was prepared and from the list 50 percent of the ratoon crop farmers were sampled at random for the study. The total number of sampled farmers stood at 31; among them 11 were from Shanghair haor, 9 from Tangua haor and the rest 11 from Bhanda beel. Data were collected by

directly interviewing the farmers. Additionally, some data were collected from the respective Upazila Agriculture Office in each haor area. The data were collected during the period from April 1989 to June 1989. The data were analysed on the basis of farm size. The farm size was defined on the basis of cultivated main boro crop land. The classified farm size groups were landless (upto 0.20 ha), small (0.21-0.81 ha), medium (0.82-1.62 ha) and large (1.63 ha and above) as followed by Jabbar ( 1978 ) and Husain, *et al.* (1985) in their studies.

**Some Socioeconomic Characteristics of the Sample Households**

Table 1 shows that out of 31 sampled households 20 were landless farms ( having upto 0.20 ha of cultivable boro land ), 10 were small farms (having cultivable boro land ranging from 0.21-0.81 ha) and the rest one was medium farm (having cultivable boro land ranging from 0.82-1.62 ha). There were no large farms among the sampled households. The table clearly demonstrates that landless and small farms are the main beneficiaries of ratoon cropping. The table further reveals that the average crop land of landless farms was 0.18 ha of which 0.12 ha was owned land and 0.06 ha rented-in. In case of

**Table 1. Sample Households and Average Size of Land Holdings by Farm Size ( Hectare )**

| Farm size | Number of sampled households (1) | Owned cultivated land (2) | Rented-in land (excluding ratoon area) (3) | Total cultivated land (4=2+3) |
|---|---|---|---|---|
| Landless ( upto 0,20 ha ) | 20 | 0,12 | 0,06 | 0,18 |
| Small ( 0,21-0,81 ha ) | 10 | 0,55 | 0,26 | 0,81 |
| Medium ( 0,82-1,62 ha ) | 1 | 1,21 | 0,21 | 1,42 |
| All | 31 | 0,29 | 0,13 | 0,42 |

Note : No land under rented-out, mortgaged-in and out,
Source : Field survey,

small farms it was 0.81 ha of which 0.55 ha was owned land and 0.26 ha rented-in; while in case of medium farms the average size of crop land was 1.42 ha of which 1.21 ha owned land and the rest 0.21 ha rented-in land. No one in the above categories of farms however, had rented-out, mortgaged-in and mortgaged-out any land. For all categories of farms, the terms and conditions of operating the rented-in land were 50 : 50 share of output between the tenants and the land owners. It may be mentioned here that such a distribution system of output of the rented-in land was applicable only for main boro paddy cultivation.

Table 2 reveals that medium farms had the largest family size while the landless farms had the smallest family size. The family sizes of medium, small and landless farms were respectively 8, 7 and 6. The incidence of illiteracy was the highest among the landless farms whose main occupation was wage earning. Sixty percent of the small farms had primary education and 50 percent of them had agriculture as their main occupation although importance of wage labour and petty trading was significant.

Table 3 indicates that landless farms were employed for the highest number of man-days in agricultural activities. They were employed for 268 man-days of which 95 man days were self-employed while 173 man-days hired out. Small and medium farms were employed respectively 47 percent and 33 percent more than medium farms. It is important to note that ratoon cropping provided a significant proportion of self-employment. In the landless size

**Table 2. Family Size, Level of Education and Occupation by Farm Size**

| Farm size | Average family size (No,) | Level of education (%) | | | | Occupation (%) | | |
|---|---|---|---|---|---|---|---|---|
| | | Illiterate | Primary | Secondary | All | Agriculture | Wage lab, | Petty business |
| Landless | 6,0 | 75,0 | 25,0 | — | 100 | 25,0 | 75,0 | — |
| Small | 7,0 | 30,0 | 60,0 | 10,0 | 100 | 50,0 | 30,0 | 20,0 |
| Medium | 8,0 | — | — | 100,0 | 100 | 100,0 | — | — |
| All | 7,0 | 58,1 | 35,5 | 6,4 | 100 | 35,5 | 58,1 | 6,4 |

Source : Field survey,

**Table 3. Average Yearly Agricultural Employment by Farm Size (Man-Days )**

| Farm size | Self-employment | | Days hired out | Total | Share of ratoon to the days self-employed(%) |
|---|---|---|---|---|---|
| | Total | Ratoon* | | | |
| Landless | 95,0 | 23,3 | 173,0 | 268,0 | 24,5 |
| Small | 170,1 | 21,9 | 72,9 | 243,0 | 12,9 |
| Medium | 182,0 | 20,4 | — | 182,0 | 11.2 |
| All | 122,0 | 22,8 | 135,1 | 257,1 | 18,7 |

* Calculated from Tables 5 and 6,
Source : Field survey.

group, it represents more than 24 percent while in small and medium size groups, it represents 13 percent and 11 percent of the self-employment respectively.

## III. DISTRIBUTION OF BENEFITS OF RATOON CROPS

### Extent of Ratoon Cultivation

The Upazila Agriculture Offices of the study areas estimated that boro ratoons were grown in only 6-12 percent of cultivated boro land. Local boro ratoons covered much more area than HYV ratoons. Among the three haors, the area under boro ratoon varied from 367 ha in Tangua haor to 214 ha in Bhanda beel, the average being 313 hectares. But the persentage of boro ratooning was higher in Shanghair haor than that in other two haors. It was mainly due to the impact of the Bangladesh Water Development Board (BWDB) project.

The sluice-gates of BWDB are kept open after mid May in order to protect the embankments from high water pressure. Under the situation, the ratoon crops can be safely grown in the boro fields. Thus, it appears that boro ratoon practices are limited to the haor areas where boro paddy becomes ready for harvest before mid April and the areas which do not undergo inundation by the end of May or early June. Therefore, the harvest of boro ratoon is to some extent, ensured by keeping the sluice-gates closed upto mid May and this can be treated as a project benefit.

Although boro is the only crop in the haor areas, cultivation of ratoons is not so intensive. Table 4 shows that ratoons were grown in only 313 ha out of 3822 ha of cultivated boro land in the study areas during 1989. The ratoon acreage represents only 8.2 percent of cultivated boro land. There are several reasons for this lower ratoon acreage as mentioned in section IV. However, the main two reasons are : (a) early flash flood and (b) lack of interest of the medium and large farmers who own the main boro land.

Table 5 shows the extent of ratoon cropping according to farm size and tenure system. It is important to note that the landless farms cultivated the largest area for ratoon crop. They cultivated ratoon in 1.01 ha of land on an average while they owned only 0.12 ha of land. The owned land is only about 12 percent of the cultivated land. On the other hand, small farms grew ratoon in 0.95 ha of which 0.50 ha was their own land. The ratooning in rent free land represents about 82 percent of the cultivated land in case of landless farms and 21 percent in case of small farms. It is interesting to note that while rented-in ratoon land of landless farms represents only about 6 percent of their ratoon area, the rented-in ratoon land of small farms

**Table 4. Extent of Ratooning in Selected Areas During 1989**

| Study area | Total cultivated boro area (Hectare) | Ratoon crop cultivated (hectare) | | |
|---|---|---|---|---|
| | | LV | HYV | Total |
| Shanghair haor | 2916 | 228 | 129 | 359 |
| | ( 100,0 ) | ( 7,8 ) | ( 4,4 ) | ( 12,2 ) |
| Tangua haor | 4885 | 216 | 151 | 367 |
| | ( 100,0 ) | ( 4,4 ) | ( 3,1 ) | ( 7,5 ) |
| Bhanda beel | 3665 | 117 | 97 | 214 |
| | ( 100,0 ) | ( 3,2 ) | ( 2,6 ) | ( 5,8 ) |
| Average | 3822 | 187 | 126 | 313 |
| | ( 100,0 ) | ( 4,9 ) | ( 3,3 ) | ( 8,2 ) |

Note : Figures in parenthesis indicate percentages
Source : Upazila Agriculture Offices,

represents 26 percent. This is due to typical 50 : 50 share-cropping arrangement between the share cropper and the land owners. In case of ratooning on the rent free land the ratoon farmers were either poor relatives or neighbours of the land owners and the farmers enjoyed the full benefits.

**Table 5. Extent of Ratoon Cropping by the Sample Farms (Hectare)**

| Farm size | Owned land | Rent free land | Rented-in land | Total ratoon area | |
|---|---|---|---|---|---|
| | per farm | | | per farm | All farms |
| Landless | 0.12 (11.9 ) | 0.83 (82.2 ) | 0.06 (5.9 ) | 1.01 (100.0 ) | 20.25 (65.98) |
| Small | 0.50 (52.6 ) | 0.20 (21.1 ) | 0.25 (26.3 ) | 0.95 (100.0 ) | 9.55 (31.12) |
| Medium | 0.81 (91.0) | — | 0.08 ( 9.0 ) | 0.89 (100.0 ) | 0.89 ( 2.90) |
| All/Av. | 0.26 (26.3) | 0.60 (60.0 ) | 0.13 (13.1 ) | 0.99 (100.0 ) | 30.69 (100.0) |

Note : Figures in parenthesis indicate percentages.
Source : Field survey.

**Beneficiaries of Ratoon Crops**

Table 5 reveals that ratoon crop was cultivated in 30.69 ha of land by the sampled farms, Among them almost 66 percent of the cropped land were cultivated by landless farms, 31 percent by small farms and the rest 3 percent by medium farms. Thus, the results indicated that the ultimate beneficiaries of ratoon crops were mainly landless and small farmers in the study area, Though the landless and small farmers under study had no sufficient ratoon acreage of their own, but they received rent free land for the purpose from the land owners on verbal request and they themselves enjoyed the full benefit, However, if in a particular year, hailstorm severely damaged the main boro crop, then some of the land owners generally demanded half benefit from the rent free land. Otherwise, the land owners were not interested in

the ratoon cropping. Even many of them did not like to take ratoon rice in their meals as they felt that it might hamper their social prestige.

### Cost of production and Return of Ratoon Crop

Input requirements for growing ratoons are minimal. As the ratoons grow from the remaining stalks of the main boro crop, no land preparation is needed. The only input needed for growing ratoons is human labour. Labour is needed for protecting the crop from grazing animals, harvesting and carrying, threshing, drying and storing the products. Fertilizers are not applied in growing ratoon crops. Table 6 reveals that harvesting and carrying appeared as the main cost item representing Tk. 300.0 for LV and Tk. 360.0 for HYV per hectare followed by threshing, crop protection and drying-storing. The total gross cost of producing a hectare of ratoon paddy averaged Tk. 630.0 for LV and Tk. 750.0 for HYV.

Table 7 indicates that as the straw yield was low, the net cost per hectare came down by only Tk. 113.1 for LV and Tk. 105.2 for HYV and making it Tk. 516.9 for LV and Tk.644.8 for HYV. The crop yield of ratoon is generally low as is true in case of other ratoon crops like sugarcane and banana. The

**Table 6. Per Hectare Cost of Production of Boro Ratoon**

| Item | Labour requirement (Hours) | | Labour cost (Taka) | |
|---|---|---|---|---|
| | LV | HYV | LV | HYV |
| 1. Protecting grazing animals | 32 | 32 | 120.0 | 120.0 |
| 2. Harvesting and carrying | 80 | 96 | 300.0 | 360.0 |
| 3. Threshing | 32 | 40 | 120.0 | 150.0 |
| 4. Drying and storing | 24 | 32 | 90.0 | 120.0 |
| Total | 168 | 200 | 630.0 | 750.0 |

Note : Labour cost has been calculated by considering labour wage @ Tk. 30.0 per day.

Source : Field Survey.

HYV ratoon usually gives higher yield than the LV ratoon, It may be noted here that all the three haors under study were similar with respect to soil type, fertility and the management practices followed, However, the ratoon yield per hectare averaged kg. 690,9 for LV and Kg. 829.7 for HYV in dry weight (Table 7). Thus, net cost per Kg of paddy averaged Tk. 0.75 for LV and Tk. 0.78 for HYV. At an estimated average market value of Tk. 5.60 per Kg, for LV and Tk 5.65 per Kg, for HYV, the farmers on the average obtainsd a net profit of Tk. 3352.2 per/ha for LV and Tk. 4043,0 per ha for HYV and Tk. 4.35 per Kg, for LV and Tk 4.87 per Kg. for HYV. Similarly, return per hour of labour averaged Tk. 19.95 for LV and Tk. 20.22 for HYV (Table 7).

**Table 7. Net Return and Profit of Boro Ratoon Production**

| Item | Quantity / Yield | | Value (Taka) | |
|---|---|---|---|---|
| | LV | HYV | LV | HYV |
| Credit : Straw, Kg | 198.3 | 184.5 | 113.1 | 105.2 |
| Net cost, per ha. | — | — | 516.9 | 644.8 |
| Net cost, per Kg. | — | — | 0.75 | 0.78 |
| Yield, per ha. in Kg. | 690.9 | 829.7 | 3869.0 | 4687.8 |
| Net profit, per ha | — | — | 3352.2 | 4043.0 |
| Net profit, per Kg. | — | — | 4.85 | 4.87 |
| Net return, per lab. hour (Above all other cost) | — | — | 19.9 | 20.2 |

Note : Considering (a) straw value @ Tk. 0.57 per kg., (b) paddy value for LV @ Tk. 5.60 per kg. and for HYV @ Tk.5.65 per kg.

Source : Field Survey.

## IV, SOCIOECONOMIC CONSTRAINTS OF RATOON CROPPING

The farmers under study faced several constraints in growing boro ratoon crops which include : (a) early flash flood, (b) water logging, (c) free animal grazing, (d) early opening of sluice-gates for fishing and (e) cutting of embankments by boatmen, fishermen and land owners. The flash flood water logging were the most serious problems in Tangua and Bhanda beel areas while in Shanghair area the notable constraint was water logging due to heavy rainfall. Besides, due to constructed embankments in Shanghair haor the

early flash flood could not cause damage to ratoon crops seriously, However, often non-ratooning farmers and the fishermen kept open the sluice-gates for fishing before the normal opening time i.e. mid May. All respondents reported that the free grazing of animals by the non-ratooning farmers was a major problem in boro ratooning. Since, ratoons were grown only in a smal l portion of boro land while the major portion of boro land was used as a pasture land, it was very difficult to protect ratoons from grazing animals. Finally, in Shanghair haor, the breaches are cut on the embankments by the boatmen for easy communication, by the fishermen for fishing purposes and by the large farmers for pisciculture in their jalmohal. Similarly, many locally made small embankments were also damaged by them.

## V. CONCLUSIONS

The haor areas of Bangladesh are mainly located in the greater Sylhet-Mymensingh districts and the areas' economy is highly underdeveloped, because only a single boro crop can be grown there during a year. About 80 percent of people in the areas are landless and marginal farmers. The government has undertaken embankments and sluice-gates projects for protecting boro crop from early flash flood water, While the major beneficiaries of these projects will be medium and large farms who own over 70 percent of cultivable land the landless and small farms may also be benefited from more secured ratoon cultivation, This paper shows that mainly the landless and small farms grow boro ratoons while the medium and large farms do not cultivate ratoons. The ratoon cropping is an important source of self-employment for landless and small farms and contributes a significant portion of their income.

Although ratoon cropping provides employment and income to poverty stricken rural poor and therefore, can contribute to alleviation of poverty in haor areas, it is unfortunately true that ratoons are grown in a very small proportion of boro land. Two major reasons for this are : (1) early flash flood and (2) lack of interest of the medium and large farmers who own the land. However, the area under ratoon is expected to increase rapidly as embankments are completed. It was found that the proportion of ratoon area in Shanghair haor was significantly higher than that in other two areas. The obvious reason is that embankments reduces the risk of crop damage.

Reducing the risk of ratoon cropping through embankments increases the probability which would induce medium and large farmers to grow ratoons by themselves, As a result, the landless and small farms will be deprived of the benefits of ratoon cropping, Since embankments are public investments, the Government can protect the interest of the rural poor by enacting rules for sharing ratooning arrangement. Under a new arrangement, the share tenants could receive two-thirds of crop while the land owners would receive one-third crop as rent. There have been fewer researches on increasing the ratoon cropping in Bangladesh. Therefore, more researches should be undertaken to increase the yield performance of ratoon cropping in the country.

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