

Socio-Economic Studies on Date Palm Plantation in Bangladesh

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ABSTRACT

The present study was undertaken to understand socio-economic aspects of date palm cultivation, marketing (both juice and gur) and return during 2006-07 cropping season in Keshabpur upzilla of Jessore district. Studies revealed that farmers didn't apply any fertilizer to date palm plant and followed no methodical cultivation practices of date palm plants in the study area. During last ten years, farmers cut 5 plants whereas planted one and half plants per year. Date palm planting was found to be higher in boundary of crops field than in scattered and/or gardens. Women members were mostly involved in process of clearing and warming up pot for juice collection, gur and patali making, both selling and collection of money for gur/patali/juice in the village level. The study reveals the emergence of new crop sharing system like other crops for date palm plant in the study area. Large and medium growers whom were not Gachee normally rented out their date palm plant on fifty –fifty sharing basis of juice during juice tapping season (about three months). About 170 - 220 litres of juice was obtained from per plant. A farmer might earn Tk. 750-850 plant⁻¹ by selling juice during the tapping season. Cost of date palm gur production was Tk. 330.0 plant⁻¹ of which 62, 18 and 14 per cent were for fuel, gachee and labour cost respectively. Gross return and gross margin were Tk. 688.40 and Tk. 358.40 plant⁻¹ respectively. Different intermediaries were involved in the marketing of date palm gur. Growers sold about 30 per cent of their gur production to direct consumers in village level. Farmers used about 30-35 litre juice and 5-7 kg gur for their family consumption which were 33 and 26 per cent of the total juice and gur production respectively. Growers stated some constraints as very low or no juice secretion from few plants, fuel scarcity for gur making, lack of gachee, increased wages of labour/gachee for juice collection, low price of gur during season, poor marketing and storage facilities for both gur and juice, lack of improved production technologies for date palm cultivation etc that need to resolved to increase date palm cultivation as well as gur production in Bangladesh.

Key words: Date palm, juice collection, gur making, gross return, gross margin

INTRODUCTION

In Bangladesh demand of sugar and gur is being increased due to urbanization and population increase while acreage of sugarcane cultivation is gradually being decreased due to higher demand for food, vegetables etc. and utilization of crop lands for houses, roads, industries etc. Therefore, there is no scope to increase sugarcane acreage to meet higher demand of sugar and gur of ever increasing population in Bangladesh. So, it is important to find alternatives. According to FAO recommendation per capita 13 kg sugar is required for human diet and as such present requirement of sugar for 140 million

population in Bangladesh is about 1.80 million tons. Present production of sugar and gur in the country is about 1.5-2.0 and 4.5-5.0 million tons respectively, and as such shortfall of sugar/gur is about 1.1-1.2 million tons. Date palm gur may be an alternative source of sugar to supplement the increased demand for sugar. (BSRI Annual Report, 2003-04).

Date palm is an important fruit-cum-cottage industrial plant in Bangladesh. It grows naturally in homesteads, road sides, embankment, fallow lands, orchard or crop fields. It is mainly cultivated in greater districts of Jessore, Khulna, Noakhali, Patuakhali and Rajshahi. Idris (1983) stated that 70 million date palm plants can be grown in road/rail/embankment without reducing acreage of other crops and 0.7 million 5-6 member rural families can survive from the earning of this plant alone. He also estimated that if date palm is grown in a planned way it is possible to run two new sugar mills and sugarcane field can be released for the cultivation of other crops. Emran (1993) stated that a gachee (labourer who cut date palm plant to trap/extract juice to make gur) might earn Tk. 1500 to Tk. 2000 from juice tapping of date palm in a season. Date palm acts an alternative source of sugarcane gur to supplement increased demand of sugar, and have a positive impact on sugar industries in Bangladesh. During juice tapping season, 200-250 litres juice is obtained from each plant and gets 25-30 kg gur/molasses (Asaduzzaman *et al.*, 1986). Chowdhury and Satter (1993) reported that last five years total cash income from date palm plants varied from Tk. 810 to Tk. 5740 per farm with a mean of Tk. 2823 per farm. Miah and Alam (2001) stated that juice secretion, degree Brix of juice and gur recovery per cent may be enhanced through application of appropriate agronomic management practices such as irrigation, NPK fertilizer application and trash mulching to date palm plants. According to BBS report date palm and palmyra palm is grown in around 10755 to 10767 hectares of land and total estimated juice production is 3.34 to 3.48 million tons, and @ 10 per cent gur recovery 0.334 to 0.348 million tons of gur is produced per year in Bangladesh.

Date palm juice and gur have higher demand in both villages and cities. It is naturally grown in the country with minimum or no inputs and care. However, date palm plant has established her to accrue an economic benefit and income generating tools to the rural livelihoods. Therefore, the study was undertaken to understand socio-economic aspects of date palm cultivation, marketing (both juice and gur) and return during 2006-07 cropping season in Keshabpur upzilla of Jessore district with the hope that its economic potentiality would be explored to farmers and policy makers. It would help policy makers in formulating future strategies to meet up increasing demand of sugar and gur in Bangladesh.

METHODOLOGY

The present study was conducted in 2006-07 cropping season in Keshabpur upzilla of Jessore district. Random sampling technique after making date palm farmers' list was used for collecting data. Data were collected from 60 sample farmers by using both structured and open ended questionnaire. Simple tabular analysis was done for the study. Use of juice and gur for home purposes were considered in calculating gross return. To examine profitability of date palm cultivation gross margin (GM) analysis was performed since farmers in short- run are more interested to know their return over variable costs rather than profit (through subtracting fixed cost from GM).

$$GR = Ag_1 \times Pg_1 + Ag_2 \times Pg_2 + S_j \times P_j$$

Where,

GR = Gross Return

Ag_1 = Amount of gur prepared from total fresh juice (first night/time collected)

Pg_1 = Price of gur kg^{-1} made from fresh juice

Ag_2 = Amount of gur made from second night/time collected juice

Pg_2 = Price of gur kg^{-1} made from second night/time collected juice

S_j = Sale of juice

P_j = Price of juice per litres

RESULTS AND DISCUSSION

Socio-economic profile of the growers

Among sample growers, 36 per cent were small (land less than 1 ha.), 33 per cent were medium (above 1 ha. and less than 3 ha.) and 31 per cent were large growers (land above 3 ha.). Educational level of sample growers were classified into illiterate, primary, secondary and above secondary. The study illustrate that about 18 per cent of sample growers were illiterate, while about 67.2, 11.5 and 3.3 per cent of growers had primary, secondary and above secondary level education respectively. The main occupations of growers were agriculture (59%) followed by business (27%) and service (14%). The average annual income of the farmers were Tk. 30,000 to 1,20,000.

Table 1. Socio economic profile of growers'.

Characteristics	Growers (per unit)
A. Age	
a. Young (20-35)	30
b. Middle age (36-55)	60
c. Old (> 56)	10
B. Farm size	
a. Small (< 1 ha)	36
b. Medium (1-3 ha.)	33
c. Large (>3 ha.)	31
C. Education level	
a. Illiterate	18
b. Primary	67
c. Secondary	11
d. Above secondary	4
D. Occupation	
a. Agriculture	59
b. Business	27
c. Service	14
E. Annual Income (Tk.)	30,000-1,20,000

Source: Field Survey, 2006-07

Main crop and cropping pattern in the area

Growers of study area cultivated various types of crops. In Rabi season, HYV boro, different types of vegetables, potato, wheat, pulses (lentil) and oil seeds (mustard) were the main crops. In Kharif-1, Aus, jute, vegetables and brinjal were the main crops and in Kharif-II, T. Aman (HYV), brinjal and papper were main crops.

Area under date palm cultivation was higher in boundary of crop land than that of scattered or gardens of date palm plants in the study area. All the crops such as T. Aman (HYV), Boro (HYV) and various winter vegetables were cultivated in the date palm plant based boundary plots.

Women involvement

Women members mainly housewives of farm family were involved in the activities of clearing and warming up of pot for juice collection, gur and patali making, selling of gur/patali/juice within Para/Mohalla (Part of village). These activities almost fully done by women members in village level. Special order was required for making patali mixing with coconut which had high demand also prepared by women members. Sometimes, women members were responsible for collecting money for selling gur/patali/juice from Para/Mohalla buyers. The activities of women members allowed male members for doing other income earnings works. Thus, women engaging themselves in such activities were contributing to increase their family income and improvement of nutrition level.

Renting/sharing system of date palm plant

The study reveals the emergence of new crop sharing system like other crops for date palm plant in the study area. Mainly large and medium growers who are not Gachee normally rented out their date palm plant on fifty –fifty sharing basis of juice during tapping season. In this case, owner of plant do not bear any cost. Rented growers bears all cost of cutting and other associated costs or he himself do the job. He also responsible for collecting juice and share out it to owner house during owner's day. They share juice in an alternative way. If rented grower takes juice for first cutting then the owner takes juice for next cutting and the process is vice-versa. This renting/sharing system of date palm plant created scope for land less and small growers to become Gachee and thus to increase their family income in some extent during juice tapping season. It was recorded that medium and large farmers normally didn't want to be Gachee because the work is something laborious and risky.

Agronomic practices of date palm plant

At present, no methodical cultivation of date palm plant is followed in the area. Even, growers have no technical knowledge on date palm cultivation, date palm cutting, juice collection and gur preparation and preservation. Growers do not apply any fertilizer and irrigation to date palm plants. New plantation of date palm seedlings are rare. Most of the date palm gardens have been sold and now mostly rice and vegetables are being cultivated in those lands. During last ten years farmers on an average cut 5 plants whereas planted

1.5 plants per year. They do not get any extension services from DAE or other organizations regarding date palm plant cultivation.

Table 2. Agronomic cultural practices of date palm cultivation and growers practices.

Agronomic Cultural Practices	Growers' Practices
Fertilizer application	Not applied
Irrigation application	Not applied
Methodical cultivation	Not followed
New seedlings plantation	Rare
Technical knowledge regarding date palm cultivation	No
Training/ Extension services received	No

Source: Field Survey, 2006-07

Harvesting of date palm juice

According to growers, date palm plant takes 7-8 years to become mature. Tapping of juice is seasonal and it is started from the month of November and continues upto mid March until day and night ambient temperature became above 32°C and 25°C respectively. First night collected juice is the sweetest and best. Good quality solid gur are prepared using 1st night collected juice. Juice collected in the second night is relatively inferior compared to 1st night collected juice, and prepared relatively poor quality gur. After these two nights, plant is allowed to remain at rest for 2-3 nights, and the same process again begins. During tapping period usually obtains 170 - 220 litres of juice per plant.

Date palm juice selling/marketing

Date palm juice selling/marketing in market places, hat etc was found to be popular in village level in the study area. At evening, growers/gachee bring fresh juice with fresh water and glass/mag to sell it to mobile consumer at the market. Fresh juice charged for Tk. 2 to 3 depending on size of mag/glass. By selling fresh juice a gachee usually earn Tk 30 to 35 per plant per day. Besides, growers/gachee who do not have date palm plant usually bought fresh juice for making pita (solid preparation by rice powder) and paiesh (semi-solid rice preparation using date palm juice/gur) and it is a very old age practice in village level. By selling juice a growers/gachee earns Tk. 750-850 per date palm plant during tapping season (about three months).

Cost and return from per date palm plant

Table 3 shows that per plant cost of date palm gur production was Tk. 330.0 of which about 62 per cent was fuel cost. Cutting/Gachee and labour cost were obtained to be 18 and 14 per cent respectively. High standard deviation indicating variation of gur production cost among respondents.

Table 3: Average cost of gur production in 2006-07 cropping season per date palm plant.

Particulars	Cost (Tk. plant ⁻¹)	Standard deviation	Percentage of total cost
Cutting/Gachee	60	23	18
Fuel for gur preparation	205	40	62
Labour	45	27	14
Pot and others	20	15	6
Total	330.00	32	100

Source: Field Survey, 2006-07

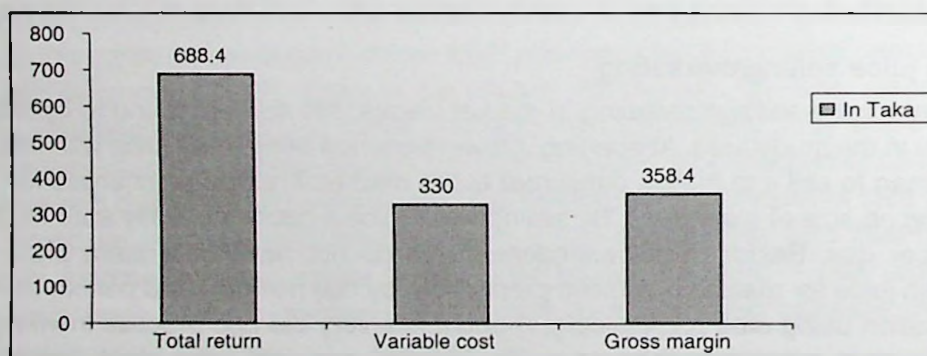
- Total number of plants of sample growers = 850

Table 4: Average per plant return from gur production in 2006-07 cropping season.

Particulars	Amount (Kg)	Tk. Kg ⁻¹	Gross Return
Gur from first night collected juice	13.70	35.00	438.40
Gur from second night collected juice	10.00	30.00	250.00
Total	23.70		688.40

Source: Field Survey, 2006-07

It can be seen from the Table 4 that when growers/gachee use whole juice for gur production he gets 23.70 kg gur plant⁻¹ of which 13.7 kg from first night collected juice and 10.0 kg from second night collected juice. It is also seen from the Figure 1 that per plant gross return was Tk. 688.4 and cost of gur production was Tk. 330.0 and gross margin was Tk. 358.4. Return per Taka investment (variable cost basis) was Tk. 2.08.

**Figure 1: Total return, Variable cost and Gross margin per date palm plant. Marketing of date palm gur**

Three types of date palm gur viz semi-liquid, solid and patali are produced in the study area. The marketing channels of date palm gur are shown in the figure 2. Growers sold 30 per cent gur to direct village consumers. They also sold gur to consumers at local/village market or upzilla large market. Bapari (middle man locally called Bapari) normally bought gur from growers/gachee at local market or upzilla large market. Some times, they bought it

directly from growers/gachee house. Bapari then sold it to aratder (traders who store gur/commodities) then via wholesaler, retailer to consumers.

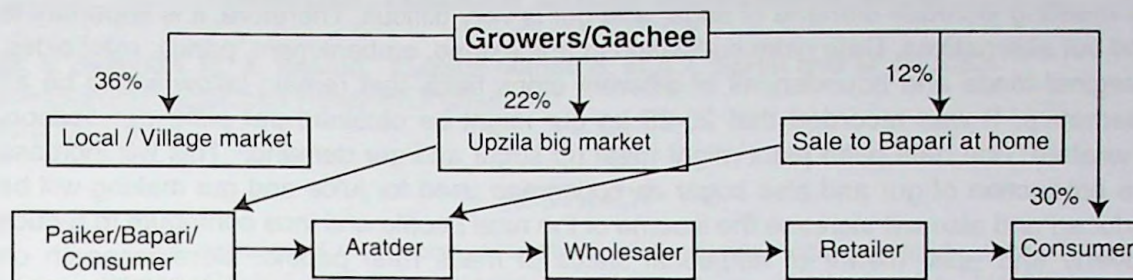


Figure 2. Marketing channel of date palm gur.

Home consumption of date palm juice and gur

The study reveals that growers used about 30-35 litre juice and 5-7 kg gur for their family purposes/ own consumption which were 33 and 26 per cent of the total juice and gur production respectively. Sometimes, they provide date palm juice and gur as souvenir/gift to their relatives to strengthen relationship.

Problems of date palm growers

It was observed that date palm growers have no technical know-how about date palm plant cutting, juice collection, gur processing and preservation. Fuel scarcity for making gur from date palm plant is one of the main constraints of growers. Increased cost of labour (Gachee cost) for date palm cutting, juice collection, lack of expert manpower (Gachee), lack of improved production technologies, low price of gur during season, poor marketing and storage facilities of juice and gur etc. are problems of growers (Table 5). Besides, all growers/gachee reported that some plants secrete no or very low juice, and it is considered as great shortcoming to increase date palm plant plantation.

Table 5. Problems of growers in planting date palm.

Problems	Number of respondent	Percentage
No or very low juice extraction by some plants	60	100
Fuel scarcity for making gur	60	100
Increased cost of labour (gachee) for date palm cutting and juice collection	60	100
Lack of expert manpower for date palm cutting (Gachee) and juice extraction	52	86
Low price of gur during tapping season	47	78
Lack of improved production technologies	45	75
Poor marketing and storage facilities of gur and juice	30	50

Source: Field Survey, 2006-07

In Bangladesh sugarcane acreage is decreasing while demand for sugar and gur is increasing due to increase of population. It is assumed that increase of sugarcane acreage for meeting increase demand of sugar and gur is very difficult. Therefore, it is important to find out alternatives. Date palm cultivation in homestead, embankment, ponds, road sides, marginal lands and boundary/ail of different crops fields that remain fallow would be an alternative. It was recorded that 20-25 kg gur might be obtained per plant per season. Therefore, one date palm plant might meet up sugar and gur demand. This will increase the production of gur and also sugar as sugarcane used for juice and gur making will be reduced and also will increase the income of the rural people and thus contribute to reduce poverty and uplift meant of nutritional status of mass rural people. More research on biological, agronomical and socioeconomic should be undertaken on date palm plant to find out appropriate method of cultivation, plant cutting, juice harvesting, gur and juice preservation and conservation and also to resolve/mitigate problems of growers. Steps should be taken to disseminate information regarding benefits of date palm cultivation and to encourage more growers to practice date palm plant plantation through collaborative role of the department of agricultural extension (DAE) and other non-government originations (NGOs) who are working in the field of social/agro forestry.

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