

An Agribusiness Study on Chewing Sugarcane in Khagrachhari District of Bangladesh

M. M. Rahman¹, S. A. Sabur², M. J. Alam² and M. J. Uddin³

ABSTRACT

The present study was an attempt to examine the agribusiness of commercial farms producing chewing sugarcane in Khagrachhari district of Bangladesh. This study was based on a sample survey in which 35 farmers of Khagrachhari Sadar Upazila and 25 traders of Khagrachhari and Chittagong district were interviewed. The primary data were collected from three categories of farmers (small, medium and large) and different traders (*Paiker* or *Bepari*, *Arathdar*, retailer and juice maker). In the study area, per hectare production cost of chewing sugarcane (with intercrops) was highest for the large farmers. But the net return and benefit cost ratio (undiscounted) were found the highest for small farmer. The marketing cost was found higher for juice maker compared to other intermediaries. Net marketing margin was also found higher for juice maker but the return on operating capital was the highest for the *Arathders*.

Key words: Agribusiness, Chewing sugarcane, Channel, Cost, Margin

INTRODUCTION

Sugarcane, one of the major cash crops of Bangladesh, is cultivated in the tropical and subtropical regions of the world. Sugarcane has a very long history of cultivation in the Indian sub-continent. The earliest reference to it is in the Atharva Veda (c. 1500-800 BC) where it is called *ikshu* and mentioned as an offering in sacrificial rites (Plant Cultures, 2012). It is not only the major cash crop but also an important food and industrial crop. Although it is grown throughout Bangladesh, its commercial cultivation for industrial supply is mostly concentrated in the northern districts and for chewing purpose it is mostly concentrated in southern and southern-east districts. Sugarcane was originally grown for the sole purpose of chewing in southeastern Asia and the Pacific. The rind was removed and the internal tissues sucked or chewed. In Bangladesh, sugarcane is not only used for sugar and jaggery production but also used for chewing purposes. Taking the average of last 10 years, out of 6.56 million MT of cane production, 29% were used for sugar production, 57% for jaggery production and the rest 14% for seed and chewing purposes (BBS, 2010).

Being alkaline in nature, sugarcane juice helps the body in fighting against cancer, especially prostate and breast cancer. Sugarcane provides glucose to the body, which is stored as glycogen and burned by the muscles, whenever they require energy.

¹ Department of Agricultural Marketing and Business Management, Sylhet Agricultural University, Sylhet-3100

² Department of Agribusiness and Marketing, Bangladesh Agricultural University, Mymensingh-2202

³ Bangladesh Sugarcane Research Institute, Ishurdi-6620, Pabna, Bangladesh

Therefore, it is considered to be one of the best sources of energy. Sugarcane juice is an excellent substitute for aerated drinks and cola. Sugarcane clears the urinary flow and also helps the kidney to perform its functions smoothly (<http://blissreturned.wordpress.com>). Supplies of agricultural products of Bangladesh must be increased to meet the growing demand arising from population growth and rising income. Sugarcane is the important food-cum-cash-cum-industrial crop and it covers over 2% of the total cultivable land. More than 0.6 million farm families are dependent on sugarcane cultivation for their subsistence. Currently, on average sugarcane is grown in 0.16 million hectare of land, of which almost one-half of area is located in the sugar mills zone, and the rest is grown in the non-mills zone, where sugarcane is mostly diverted for jaggery and juice production. Sugarcane crop contributes 0.67% to the national GDP. The highest contribution comes from jaggery sector (0.39%) followed by sugar (0.15%), chewing and juice (0.04%), seed (0.03%), cattle feed and fuel (0.03%) and by-product (0.03%), respectively (Rahman and Mondal, 2010).

Prospects for chewing sugarcane cultivation in Khagrachari district of Chittagong Hill Tracts (CHT) region appears bright as the soil and land of the district is suitable for sugarcane cultivation. Around ten thousand farmers in the Khagrachhari Sadar, Dighinala, Panchhari, Mohalchhari, Luxmichhari achieved a bumper output of the crop by following the scientific methods. Every year almost 300 hectares of land are brought under chewing sugarcane cultivation in this district and farmers have the high profit motive to cultivate it. That is why chewing sugarcane farming has evolved as a new agribusiness. A good number of studies have been conducted on production and marketing of sugarcane in different mill zone area in Bangladesh. But to the best of author's knowledge no study on chewing sugarcane agribusiness was conducted in Bangladesh. So, this has inspired the researcher to conduct an agribusiness study on chewing sugarcane. It is expected that result of the study will help to knock the door of policy maker in formulating different policies to flourish this prominent agribusiness sector. This study, therefore, may serve as a basis for further study.

The overall objective of the present study is to investigate the prospect of agribusiness of chewing sugarcane in Khagrachhari district of Bangladesh. The specific objectives of the study are as follows:

- i. To examine the profitability of cultivating chewing sugarcane.
- ii. To evaluate the existing marketing system of chewing sugarcane and
- iii. To estimate the marketing cost and margin of chewing sugarcane at different stages of marketing

METHODOLOGY

The present study was conducted in some selected areas of Khagrachhari district because of the fact that during last several years chewing sugarcane production has increased sharply in this area. Data were collected from farmers in Khagrachhari Sadar Upazila and from market participants in Khagrachhari and Chittagong. In the present study, the sample included the chewing sugarcane growers and different market participants such as *Paiker* or *Bepari*, *Arathdar*, retailer and juice maker. Stratified

random sampling technique was adopted to select the 35 chewing sugarcane farmers of which 20 are small, 10 are medium and 5 are large and convenience sampling technique was adopted to select 25 different market participants comprising 8 *Paikers* or *Beparis*, 5 *Arathdars*, 7 retailers and 5 Juice makers. Selected respondents were interviewed directly with the help of pre-tested survey schedules during September to October, 2012. Collected data were checked and crosschecked before transferring to the computer. Mostly tabular method of analysis was adopted and to interpret the findings, descriptive statistics (averages, ratios and percentages) were used to fulfill the objectives. For estimating gross return, net return, benefit cost ratio (BCR), gross marketing margin, net marketing margin and return on operating capital the following formula were used:

Gross return = Yield × Sale prices

Net return = Gross return - Total cost

Benefit cost ratio (BCR) = $\frac{\text{Gross return}}{\text{Total cost}}$

Gross marketing margin = Sale price - Purchase price

Net margin = Gross marketing margin - Marketing cost

Return on operating capital = $\frac{\text{Net margin}}{\text{Total operating capital}} \times 100$

RESULTS AND DISCUSSION

Profitability of commercial cultivation of chewing sugarcane

To earn profit is the main objective of a farmer. In order to earn a respectable economic return, production cost becomes an important factor and accordingly it plays a dominant role in the decision making process of farmers. Cost and returns were calculated on the basis of actual market prices.

Production cost: Total cost of production involves all cost items incurred by the farmers in growing chewing sugarcane from planting to harvesting. Table 1 show that per hectare production costs of chewing sugarcane (with intercrops) was Tk.324566, Tk.352911 and Tk.360197 for the small, medium and large farmers, respectively. Per hectare production cost of all farms was Tk.345892. Human labour cost, the most important cost item, accounted for 37%, 40% and 39% of total production cost for small, medium and large farmer respectively. Production cost was the highest for large farmers because of the fact that they use more labour and other inputs compared to other groups of farmers.

Table 1: Per hectare total cost of production of chewing sugarcane under different farm size groups

Items of cost	Small Farmer	Medium Farmer	Large Farmer	All Farmer
	Cost (Tk./ha)	Cost (Tk./ha)	Cost (Tk./ha)	Cost (Tk./ha)
Human labor	119460 (36.8)	141326 (40.0)	139609 (38.8)	133465 (38.6)
Plant cane needed for setts	46697 (14.4)	47292 (13.4)	43771 (12.2)	45920 (13.3)
Fertilizers				
Urea	6648 (2.0)	7789 (2.2)	6693.8 (1.9)	7044 (2.0)
TSP	5296 (1.6)	4393 (1.2)	4551 (1.3)	4747 (1.4)
MoP	3047 (0.9)	3455 (1.0)	3075 (0.9)	3193 (0.9)
Gypsum	1396 (0.4)	1394 (0.4)	1823 (0.5)	1538 (0.4)
Boron	2401 (0.7)	2138 (0.6)	2261 (0.6)	2267 (0.7)
Insecticides				
Furadan	7534 (2.3)	6541 (1.9)	6980 (1.9)	7017 (2.0)
Regent	4563 (1.4)	4423 (1.3)	4838 (1.3)	4608 (1.3)
Others	518 (0.2)	1888 (0.5)	898 (0.3)	1102 (0.3)
Manure	1776 (0.5)	1271 (0.4)	1822 (0.5)	1623 (0.5)
Irrigation	16341 (5.0)	12373 (3.5)	16092 (4.5)	14935 (4.3)
Bamboo	24925 (7.7)	24046 (6.8)	24824 (6.9)	24598 (7.1)
Rope	6781 (2.1)	8418 (2.3)	6601 (1.8)	7267 (2.1)
Machinery cost for land preparation	8748 (2.7)	6324 (1.8)	7410 (2.1)	7494 (2.2)
Machinery cost for spraying insecticide	329 (0.1)	494 (0.1)	247 (0.1)	357 (0.1)
Cost for intercrops				
Seed/seedling	3631 (1.1)	4003 (1.1)	6720 (1.9)	4785 (1.4)
Urea	1243 (0.4)	2309 (0.7)	2124 (0.6)	1892 (0.5)
Tsp	870 (0.3)	625 (0.2)	1313 (0.4)	936 (0.3)
Mop	392 (0.1)	273 (0.1)	729 (0.2)	465 (0.1)
Insecticide & others	744 (0.2)	854 (0.2)	769 (0.2)	789 (0.2)
Human labor	18121 (5.6)	26898 (7.6)	28593 (7.9)	24537 (7.1)
Interest on operating capital @ of 12% for 1 year	15164 (4.7)	16904 (4.8)	17578 (4.9)	16549 (4.8)
Land use cost	27942 (8.6)	27479 (7.8)	30875 (8.56)	28765 (8.3)
Total	324566(100.0)	352911 (100.0)	360197(100.0)	345892 (100)

Note: Figures within parenthesis indicate percentage of total cost.

Returns: It is seen from Table 2 that the highest net return of chewing sugarcane was received by small farmers, followed by large and medium farms. Although gross return was slightly higher for small farmers, their lower cost helped them obtaining highest net return. Average return to each taka spent in production is a vital criterion for measuring the profitability of running any enterprise. In this study benefit cost ratio (undiscounted) for chewing sugarcane was calculated as a ratio of gross return to total cost. Table 2 shows that the BCRs of chewing sugarcane for small, medium and large farmers were 2.30, 1.99 and 2.05, respectively. It is evident from the results that chewing sugarcane

cultivation is a profitable business. Although the production cost was the lowest for small farmers but proper management practices and intensive care brought the highest net return to them.

Table 2: Returns of chewing sugarcane

Items	Small Farmers	Medium Farmers	Large Farmers	All farmers
Yield (PPH)	42819	40788	45139	42915
Value of output (Tk./ha)	705222	654238	674380	677947
Value of intercrops (Tk./ha)	42818	46670	62726	50738
Gross return (Tk./ha)	748040	700908	737106	728685
Total cost (Tk./ha)	324566	352911	360197	345892
Net return (Tk./ha)	423474	347997	376909	382793
BCR (Undiscounted)	2.30	1.99	2.05	2.11

Marketing system of chewing sugarcane

A marketing system includes all activities involved in the flow of goods from the point of initial producers to the consumers. It includes exchange activities associated with transferring property right to commodities, physically purchasing and allocating resources, handling products, disseminating information to participants and making institutional arrangement for facilitating these activities. In countries where agriculture is the principal economic activity, the marketing system becomes more important. It plays two important roles. Firstly, the role of physical distribution which is concerned with the physical handling and transfer of products from producers to consumers, and secondly, it adds value to farm commodities and facilitates the exchange process between buyers and sellers (Kohls and Uhl, 2005).

The three components of chewing sugarcane marketing system, marketing channels, market intermediaries and marketing functions, were examined in turn. These are discussed below.

Marketing channels of chewing sugarcane: Marketing channels are alternative routes of product flows from producer to consumers (Kohls and Uhl 2005). Marketing channel is the conduit through which a product flows on its way to the ultimate consumers. In other words, marketing channels refers to the sequential arrangements of various marketing intermediaries involved in the movement of products from growers to the ultimate consumers. The different marketing channels of chewing sugarcane found in the study area are shown in Figure 1.

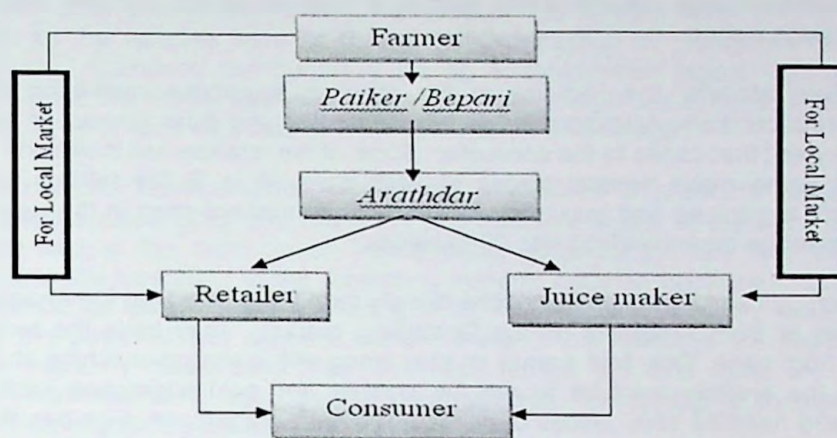


Figure.1 Marketing channels of chewing sugarcane in Khagrachhari district

The marketing channels of chewing sugarcane existed in the study area are as follows:

Channel 1. Farmer → Paiker/Bepari → Arathdar → Retailer → Consumer

Channel 2. Farmer → Paiker/Bepari → Arathdar → Juice maker → Consumer

Channel 3. Farmer → Retailer → Consumer

Channel 4. Farmer → Juice maker → Consumer

Market Intermediaries

A brief description of intermediaries participating in the marketing channels of chewing sugarcane in the study area is given below.

Farmer: The farmer constituted the primary link of marketing channel. The farmers and various intermediaries formed linkages in the channels. Most of the farmer (95%) sold their cane to the *Paiker* or *Bepari*. Only a few (5%) farmers sold to the local retailers and juice maker.

Paiker or Bepari: It was observed that most of the *Paikers* were non local. They came from different upazila of Chittagong district. Sometimes the *Paikers* are called as *Beparis*. The *Paikers* handled a large volume and possessed more capital. All of the *Paikers* entered into the business during the month July-August. They made the contract with the farmer before five or four month of harvesting and gave some advance payment. *Paikers* sold their total purchase to the Chittagong market in the mid-September to February and they handled on an average one lakh pieces of canes per month.

Arathdar: *Arathdars* are big and licensed traders, who play an important role in chewing sugarcane marketing. All the *Arathdar* were full time traders and they had fixed establishment. There were 8-10 *Arathdars* in Chittagong market. They have permanent

staff and handled a large volume (4 lakh pieces) of cane per month. Actually, they served as a commission agent.

Retailer: The retailers, the last link in the chewing sugarcane marketing channel, purchase products from *Arathdars* in the distant market and from farmers in the local market. They sell that canes to the consumer. Some of the retailers sell their cane without cutting and some make several pieces of each cane (4 to 5) for selling. They are independently organized and maximum had have no permanent shop in the market and per month average cane handling was 2000 pieces.

Juice maker: Juice makers purchase cane directly from the growers (in the Khagrachhari local market) or from *Arathdars* (in the Chittagong market). They have the facilities to make juice from cane. They had a small crusher along with a shallow machine and a van. They used the shallow machine to run the crusher and sold sugarcane juice to the consumer and handled 1800 pieces of canes per month. Sugarcane juice has the huge popularity to the consumer and it gives instant energy to them. But there is a question about hygiene.

Marketing Functions Performed by Intermediaries

The marketing functions involved in the movement of goods from the producer to its ultimate consumer vary from commodity to commodity, market to market, the level of economic development of the country or region and the final form of consumption (Acharya and Agarwal, 1998). In this study, the marketing of chewing sugarcane has been broken down into various functions such as buying and selling, pricing, transportation, sorting, grading and bundling and market information. These are discussed below.

Buying and selling: Buying and selling are the functions of exchange. Both have primary objects of negotiating favourable terms of exchange. At every stage, buyers and sellers come together, goods are transferred from seller to buyer and the possession utility is created to the commodities. The number of times the selling and buying activity is performed depends on the length of the marketing channel. There is a forward contract between the farmers and the *Paikers* or *Beparis* in the study area. Before five to six months of harvesting a negotiation is made on price and harvesting time. A certain portion of the total payment is paid by the *Paikers* or *Beparis* at the time of contract and rest of the payment is made at the harvesting time. Till that harvesting period farmers cannot sell any cane from their plot and continue to take care of crops. *Paiker* or *Bepari* purchased 95 percent of cane from farmer at farmyard and then sold 100 percent of it to *Arathdars*. *Arathdars* served as a commission agent. The local retailers and juice makers purchased all cane from farmers. On the other hand, retailers and juice maker of distant market (Chittagong) purchased 100 percent cane from the *Arathdars*.

Pricing: The market price is the result of interaction of supply and demand forces. In the study area, the intermediaries and the chewing sugarcane farmers follow the open bargaining for fixing the prices. Compared to the traders the individual farmers have low bargaining powers. The price of chewing sugarcane depends on its height, girth,

erectness, color and variety. Prices prevailed at the farmers level during the time of interview by the varieties were Tk.16 and Tk.12 per piece for Rangbilash and CO-208, respectively. *Arathdars*, are generally act as a commission agent, charge Tk.50 as commission to the retailer and juice maker for every 100 pieces of cane. And at the retail level per piece of cane was sold at Tk.30 to Tk.35 on an average.

Transportation: Transportation enables the movement of products between places, which creates place utility and facilitates availability of goods at the right time, in right condition and at the right place. Transportation is important not only because it is essential to the operation of the marketing system, but also because it accounts for a very substantial part of total marketing cost. An effective transport system helps to expand the potential and dynamic market areas. It has become the life-blood of the modern economy now-a-days. Van, rickshaw, tempo, bus and truck are the general modes of transportation used by the intermediaries. The modes of transport used by different intermediaries are shown in Table 3.

Table 3: Modes of transportation used by intermediaries

Intermediaries	Modes of transportation (percent)			
	Van	Tempo	Bus	Truck
<i>Paikers/Bepari</i>	-	-	-	100
Retailer	80	15	5	-
Juice maker	85	15	-	-

Source: Field Survey (2012)

It is observed from Table 3 that *Paikers* or *Beparis* used truck (100%) as a mode of transportation. *Arathdars* needed not to transport their product so they did not use any mode of transportation. Most of the retailer and juice maker (80% and 85% of total, respectively) used van as their main mode of transportation.

Grading: Grading refers to the sorting of products into various established or accepted standards quality. It is a marketing function which facilitates the movement of produce. There was no prescribed grade standard for chewing sugarcane marketing in the study area. Grading was roughly done according to height, girth, color and erectness of the cane by the *Paikers* or *Beparis*, *Arathdars* and retailers.

Storage: Storage as an important marketing function involves holding and preserving goods from the time they are produced until they are needed for consumption. Storage is an exercise of human foresight by means of which commodities are protected from deterioration, and surplus supplies in times of plenty are carried over the season of scarcity. The storage function, therefore, adds the time utility to products. In the chewing cane marketing, storage was observed in the case of *Arathdars*. The duration of storage was not more than fifteen days. To store the product, *Arathdar* maintain simply a shade or room.

Market information: Market information is a facilitative marketing function required for an efficiently operating marketing system. Visit to market and personal observation and the fellow traders were the main sources of market information for the chewing sugarcane traders. All the intermediaries collected information through personal observation and visit

to local market. Fellow traders were the important source of information for the intermediaries. About 90 percent of retailer, 80 percent of juice maker, 30 percent *Paikers* received information from their fellow traders. They extensively used mobile phones in collecting price information from the fellow traders without visit to market.

Marketing costs and margin of chewing sugarcane intermediaries

Among the all traders of chewing sugarcane, juice makers both at local and distant markets incurred the highest marketing cost (Tk.4040 for local and Tk.5450 for distant market). Transportation, harvesting, grading, market toll, wages, personal expenses and bundling and loading costs were the major cost items for chewing sugarcane marketing (Table 4).

Table 4: Marketing costs of chewing sugarcane intermediaries

(Tk. per 1000 cane)

Cost items	<i>Paikers or Beparis</i>	<i>Arathdar</i>	Retailer		Juice maker	
			DM	LM	DM	LM
Transportation	1800(36.8)	-	2271(58.0)	1650(53.1)	2570(47.2)	1650(40.8)
Harvesting, grading and loading	2165(44.3)	-	-	-	-	-
Harvesting and loading	-	-	-	500(16.1)	-	500(12.4)
Market toll	358(7.3)	-	117(3.0)	100(3.2)	-	-
Loading	-	-	94(2.4)	-	120(2.2)	-
Unloading	191(3.9)	-	-	-	-	-
Wages and salaries	-	117(53.6)	-	-	-	-
Wages	74(1.5)	-	-	-	-	-
Personal expenses	37(0.8)	22(10.1)	621(15.9)	600(19.3)	810(14.9)	550(13.6)
Mobile cost (telephone)	7(0.1)	3(1.4)	311(7.9)	260(8.4)	350(6.4)	300(7.4)
Tips and donations	254(5.2)	-	-	-	-	-
Rent	-	66(30.2)	-	-	-	-
Electricity	-	8(3.7)	-	-	-	-
Security	-	2(0.9)	-	-	-	-
Trade license	-	0.4(0.2)	-	-	-	-
Commission (to <i>Arathdar</i>)	-	-	500(12.8)	-	500(9.2)	-
Fuel cost	-	-	-	-	700(12.8)	650(16.1)
Cost of processing machine	-	-	-	-	251(4.6)	250(6.2)
Cost of water	-	-	-	-	100(1.8)	100(2.5)
Others	-	-	-	-	49(0.9)	40(1.0)
Total	4886	218.4	3914	3110	5450	4040

Note: Figures within parenthesis indicate percentage of total marketing cost

DM: Distant Market; LM: Local Market

The net marketing margins of *Paikers* or *Beparis*, *Arathdars*, retailers and juice makers were estimated at Tk.1114, Tk.281.6, Tk.5443 and Tk. 15050 per thousand canes, respectively. *Arathdars* received the lowest marketing margin but their return on

operating capital was the highest (128.94%). On the other hand, juice makers received the highest marketing margin and return on operating capital (ROO) was the lowest for the *Paikers* or *Beparis* (5.46%) (Table 5).

Table 5: Marketing margin of chewing sugarcane intermediaries

(Tk. per 1000 cane)

Intermediaries	Purchase Price	Sale Price	Gross marketing margin	Marketing cost	Net marketing margin	ROO (%)
<i>Paiker or Bepari</i>	15500	21500	6000	4886	1114.0	5.46
<i>Arathdar</i>	-	-	500	218.4	281.6	128.94
Retailer (DM)	21500	30857	9357	3914	5443.0	21.42
Retailer (LM)	18000	25500	7500	3110	4390.0	20.79
Juice maker (DM)	21500	42000	20500	5450	15050.0	55.84
Juice maker (LM)	18500	35000	16500	4040	12460.0	55.28

DM: Distant Market; LM: Local Market

CONCLUSION

Chewing sugarcane is a prominent agribusiness sector in Chittagong hill tracts. It reveals that commercial cultivation of chewing sugarcane is highly profitable. The main income source of the peoples of Chittagong hill tracts is agriculture. This agriculture could be converted into agribusiness. The commercially farm produced chewing sugarcane is a strong step of this arena. However, there is a scope to introduce juice making under hygienic system. At present, juice is extracted from sugarcane through traditional unhygienic procedure. Therefore improved hygienic method for getting juice from sugarcane is needed to be developed. A large investment and planning is needed to establish a standardized processing and preservation technology of chewing sugarcane and its juice. So, the government should take initiative to flourish this prominent agribusiness sector.

REFERENCES

- Acharya, S. S. and Agarwal, N.L. 1998. *Agricultural Marketing in India*. 3rd Edition, Oxford and Ibh Publishing co. Pvt. Ltd., New Delhi.
- Bangladesh Bureau of Statistics 2010. *Year Book of Agricultural Statistics of Bangladesh*, Ministry of Planning, Government of the People's Republic of Bangladesh. Dhaka, Bangladesh.
- <http://blissreturned.wordpress.com/2012/02/02/sugarcane-health-benefits-of-eating-sugarcane-and-drinking-its-juice/>
- http://www.kew.org/plant-cultures/plants/sugar_cane_history.html
- Kohls, R. L. and Uhl, J. N. 2005. *Marketing of Agricultural Products*, Fifth Edition, Macmillan Publishing Co. Inc., New York.
- Rahman M. M. and Mondal M. R. I. 2010. *Agricultural Research Priority: Vision-2030 and Beyond*. Final Report, Bangladesh Agricultural Research Council, New Airport Road, Farmgate, Dhaka-1215, Bangladesh.