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## ECONOMICS OF PRODUCTION AND MARKETING OF BETEL LEAF IN SELECTED AREAS OF BAGERHAT DISTRICT, BANGLADESH

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### ABSTRACT

This study investigated the profitability and the existing marketing channel of betel leaf in Bagerhat district, Bangladesh. Simple random and convenient sampling technique was employed to select 130 respondents from the study areas. Data were collected using a structured questionnaire. Gross margin analysis was used to estimate the profitability of betel leaf production in the study area. Results showed that farmers received the highest profit in the 4th year (BCR 1.62). The Gross Margin (GM) was estimated Tk. 396653 per hectare with Benefit Cost Ratio (BCR) of 1.37. The betel leaf farmer in the study area received the highest return in the 4th year (BCR 1.62). Marketing margin analysis appeared that farmer's sales price was Tk. 31.25, Tk. 210.43 and Tk. 331.56 of the small, medium and large size of betel leaf, respectively. The highest degree of value addition was estimated at Tk. 86.31 and Tk. 76.01 for large and medium-size betel leaf for the retailer. The marketing channel in the study area was simple and dominated by the intermediaries due to less opportunity shifting market.

### INTRODUCTION

The Betel is the leaf of a vine commonly known as *pan*, *Nagaballi*, *Nagurvel*, *Saptaseera*, *Sompatra*, *Tamalapaku*, *Tambul*, *Tambuli*, *Vaksha Patra*, *Vettilai*, *Voojanganalata* etc., belonging to the Piperaceae family and widely familiar for its medicinal belongings (Guha 2006; Hossain et al. 2012). The betel plant was originated in South and Southeast Asia which grows well in tropical areas. Research by the World Health Organization reported that as betel quid, Southeast Asian community consumes betel leaf widely (WHO, 1998). About 30% of adults chew betel quid in Bangladesh and in the world context it is approximately 10-20% (Gupta and Warnakulasuriya 2002, Flora et al. 2012). In the year 2016-17, in Bangladesh, a total betel leaf cultivation area was 23876.4529 ha, producing 2,14,000 MT betel leaf whereas in Bagerhat was 2427 acre and 5074 MT respectively (BBS, 2017). Among all the areas of Bangladesh, Sylhet, Moulvibazar, Jessore, Khulna, Kustia, Bagerhat, Satkhira, Narail, Bhola, Barisal, Faridpur, Rajshahi, Rangpur, Gaibandha, Pabna, Cox's Bazar, and the greater Chittagong district are the areas where betel leaf is cultivating widely (BBS, 2017; Fila et al. 2006). At present betel leaf has a broad market and Bangladesh is exporting quality betel leaves to many countries of Asia and Europe. The leading exporting country of betel leaves is India, Saudia Arabia, Pakistan, United Arab Emirates, England, Germany and Italy (Banglapedia).

The subtropical monsoonal and fertile soils make Bangladesh much apposite for agricultural production. This favorable climate condition makes this country able to produce a wide variety of

economically significant agricultural products. Betel leaf usually known as *Pan* in Bangladesh grows well in tropical areas. The number of households that began betel leaf cultivation in the last 20 years or so increased rapidly and the number of cultivators continues to grow.

It is a climber cash crop which has been cultivated over Bangladesh from centuries. In Bangladesh, two types of betel leaf cultivation method are practised which are a closed system of cultivation called Barejas and another one is open system cultivation using supporting plants. Most of the betel leaf farmer except hill tracts areas practice close system method using Barejas. Bareja is a particular type of rectangular structure which is mainly used for shade and artificial support of betel leaf plant. Generally, it is made on faintly sloppy land.

On the other hand, Farmers in Sylhet, Chittagong and some other regions practice open system betel leaf cultivation due to non-availability of suitable plane land. Although, in Bagerhat and near about this area, substantial numbers of farmers are directly and indirectly dependent on it for their livelihood, till now there are not enough number published documents which will help for further policy-making and implementation. This study is designed to assess the economics and marketing of betel leaf in Bagerhat to provide useful information to the policy makers, researchers and scholars.

## MATERIALS AND METHODS

### Study area and sampling technique

To attain the objectives of the study, *Mollahat*, *Fakirhat* and *Chitalmari upazilla* in Bagerhat district were selected purposively based on the intensity of *Baraj*. A total of 60 samples, 20 from each upazila, were taken through face to face interview by using simple random sampling technique. Fifty Retailers were interviewed by convenient sampling. Since every upazila had one small betel leaf market, each market was visited several times for getting adequate information and a total of 20 respondent rather than retailer and producer were interviewed. Data was checked before putting it into excel sheet for minimizing errors. Data were collected during the period from March 2017 to June 2017 from selected farmers.

### Analytical technique:

$$\pi_1 = P_B \cdot Q_B - \sum (P_{xi}X_i) - TFC$$

Where

$\pi_1$  = Profit from betel leaf production (Tk/ha);

$P_B$  = Per unit price of betel production (Tk/ton);

$Q_B$  = Quantity of Betel Leaf (Ton);

$P_{xi}$  = Per unit price of i-th inputs used;

$X_i$  = Quantity of i-th inputs used;

$i = (1, 2, 3, \dots, n)$ ; and

TFC = Total fixed cost involved in per hectare production of Betel Leaf (Tk/ha)

GMM has been estimated as follows:

$$GMM = SP - PP \text{ [Acharya and Agarwal, 2004]}$$

Where, GMM=Gross Marketing Margin; PP = Purchase price; and SP = Sales price.

## RESULTS AND DISCUSSIONS

### Input use pattern

It was observed that several types of inputs used in betel leaf production of which human labour, seed, cowdung, oil cake and different fertilizers were mainly used. For the application of other activities such as harvesting, irrigation, spraying insecticides, fertilizer application, weeding etc. in Boroj, human labour was mainly required. The highest number of human labour was used in the first year for preparing Boroj and planting vines the average number of human labour used in betel leaf production was 1665 manday/ha and it varied from year to year based on the need for *boroj*. The average amount of cowdung used by the respondent in the study area was 2.55t /ha and the highest amount was used (Table1).

### Cost of production

Human labour, seed, *boroj* making material, fertilizers, pesticides, irrigation etc. were included in the cost of production. These were considered as variable costs and rental value of land was treated as fixed cost.

Parameter	Period of cultivation (Year)						Average
	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6-10 <sup>th</sup>	
Yield(t/ha)	7.12	7.54	8.73	9.07	8.64	8.24	8.05
<b>A. Total Return</b>	978526	1024116	1264540	1391967	1249971	1169274	1144785
<b>B. Variable Cost</b>							
Human labour	366000	431400	484200	462600	483900	456600	447450
Seed (Vine)	96129	0	0	0	0	0	16021.5
Boroj materials	329034	247234	225345	253452	213653	234598	250553
<b>Manures</b>							
Cowdung	5880	0	1680	1320	2520	4440	2640
Oilcake	56700	48300	37800	46200	52500	44100	47600
<b>Fertilizers</b>							
Urea	2080	2320	2592	3408	2752	3024	2696
TSP	7440	6520	6260	5340	6140	3780	5913
MP	192	240	320	240	272	128	232
Others	1740	1543	1381	1245	1670	1250	1472
Irrigation	3542	3349	3532	3212	2278	2840	3126
Pesticides	6496	5437	3421	5643	4534	6730	5377
<b>C. Total Variable Cost</b>	875233	746343	766531	782660	770219	757490	783079
Interest on operating cost	54314	48551	45992	46960	46213	45449	47489
Rental value of land	29700	29700	29700	29700	29700	29700	29700
<b>D. Total Fixed Cost</b>	84014	78251	75692	76660	75913	75149	77189
<b>E. Total cost(C+D)</b>	959247	824594	842223	859320	846132	832639	860693
<b>F. Gross Margin(A-C)</b>	103293	277773	498009	609307	479752	411784	396653
<b>G. Net Return (F-D)</b>	19279	199522	422317	532647	403839	336635	319040
<b>H. BCR (Undiscounted) (A÷E)</b>	1.02	1.24	1.5	1.62	1.48	1.4	1.37

\*All the figures are taken in integer form (Except yield and BCR) for the simplification of calculation.

The highest (959247Tk/ha) and the lowest cost (824594Tk/ha) of betel leaf production were observed in the 1<sup>st</sup> and 2<sup>nd</sup> year respectively. Initial investment on *boroj* making material and seed was the reason behind the inflated cost in first year. The respondents mentioned that seed cost was needed only in the first year and additional cost need for seed was fulfilled from the seed produced in the

*boroj*. The one to one average irrigation and pesticide cost of betel leaf production was 3126 Tk/ha and 5377 Tk/ha. Followed by the *boroj* making a cost, human labour cost was highest in betel leaf cultivation and it was about half the total cost of production.

### Returns from production

In different areas, there were various local unit of such as *bira*, *Sali*, *gadi*, *kuri*, *pon* etc. based on which betel leaf was sold. After collecting the data from the survey area based on the local unit, it was converted in ton per hectare. On average, 265 number of betel leaf equals 1(one) kg (Moniruzzaman *et al.*, 2008). That means 1-ton equal to 265000 number of betel leaf.

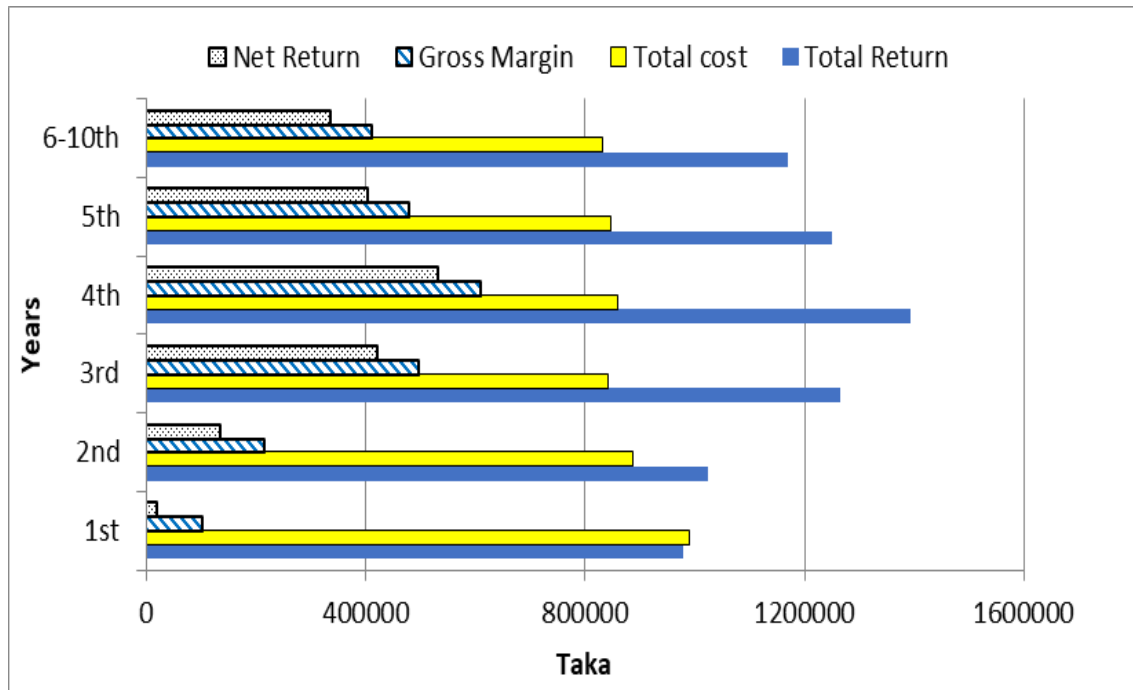


Figure1. Cost and return of betel leaf production (Tk.)

It is observed from Table 1 that, the lowest betel leaf production was in the 1<sup>st</sup>-year-old *boroj* and yield started increasing from 2<sup>nd</sup> to 5<sup>th</sup> year-old *boroj*. The average per year production of betel leaf was 8.23 ton which was smaller than the average (2014-2017) national yield of 8.73 t/ha (BBS 2017). The price of betel leaf varied from area to area and from season to season and ranges from Tk.20 to Tk.120 per *pon*. Moreover, the demand and supply of betel leaf in different time also affect the price. The peak season of betel leaf production is July to March and lean season production is March to May which increases the rate of betel leaf due to excess demand than supply.

### Marketing Channel of Betel Leaf

In the betel leaf marketing system, intermediaries perform crucial commercial functions in a chain from producers to the final consumers. Four functionaries were found to be involved in the marketing of betel leaf in the study area. They were, Aratdar, wholesaler, Paiker and retailer (Fig. 1). A marketing channel is a set of practices or activities necessary to transfer the ownership of goods from the point of production to the point of consumption. In another word, it is the sequence of intermediaries or middle, and the marketers through which goods pass from producers to consumers (Olukosi *et al.*, 2005). Marketing channels are important in evaluating marketing system because they indicate how the various market participants are organized to accomplish the movement of a product from the producer to the ultimate consumers (Thomas *et al.*, 2010). The activities involved in the transfer of goods are completed through buying and selling functions. Arathdar does the service of negotiation between wholesalers and small paikers of betel leaf and help them at their own business premises on receipt of commission. They do not take the ownership of the products. The local Paiker

sell the product through local market, retailers and Paiker and send their product at the Dhaka market. The retailer buy their products from Dhaka market and sells it to the consumer.

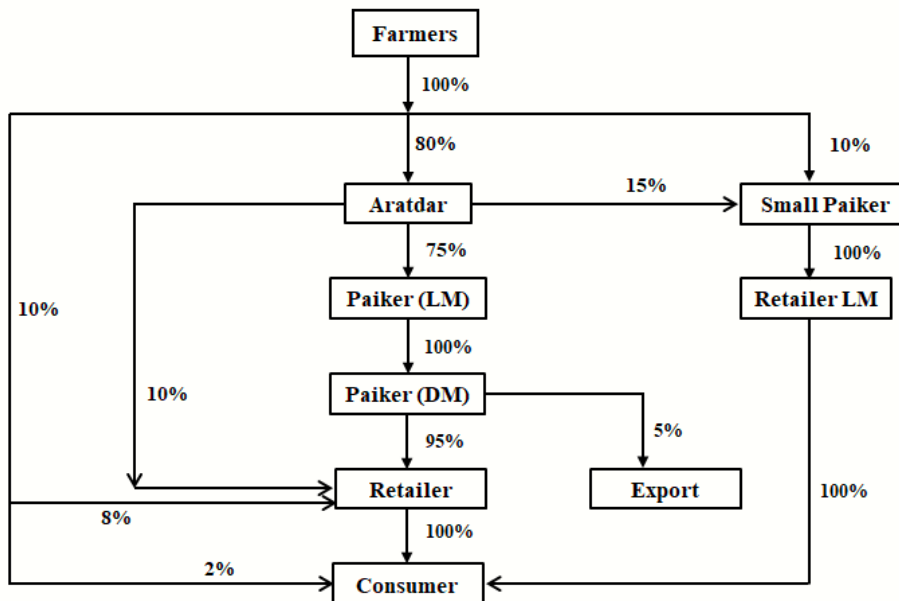


Figure 2. Marketing channel of betel leaf in the study area; \*LM=Local market and DM= Dhaka market

In the study area, there are three types (small, medium, large) of betel leaf on the basis of size but there is no standard measurement. Most of the time, it is assessed on the base of eye estimation. Price vary from season to season and during the month of November to March prices are quite highest due to lower production.

**Table 2: Purchase and sales price of betel leaf for different intermediaries**

Betel leaf size	Producer/Farmer		Paikar (local market)		Paikar (Dhaka market)		Retailer	
	Sales price/80 leaf	Purchase price/80 leaf	Purchase price/80 leaf	Sales price/80 leaf	Purchase price/80 leaf	Sales price/80 leaf	Purchase price/80 leaf	Sales price/80 leaf
Small	31.25	31.25	31.25	36.43	36.43	41.56	41.56	65.67
Medium	210.43	210.43	210.43	218.37	218.37	226.76	226.76	238.35
Large	331.56	331.56	331.56	339.54	339.54	347.35	347.35	367.65

**NB:** On an average, the weight of 265 number of betel leaf = 1 kilogram (Moniruzzaman, 2008). In local unit, 80 leaf= 1 pon

In that time price differs from Tk 180/pon to Tk 470/pon. Table 2 shows that sales price fluctuates from Tk 31.25 to Tk 331.56 per pon for farmers and retailers varies from Tk 65.67 to Tk 367.65 per pon.

From Table 3, it is clear that, retailer get the highest margin comparing to other intermediaries. Marketing cost was estimated at Tk. 2.56, Tk. 2.17 and Tk. 2.78 per 80 leaves for Paiker in local market, Paiker in Dhaka market and retailers respectively. The highest degree of value addition was found (57.70%) in paiker of Dhaka market for small size leaf, whereas the highest degree of value addition was occurred for medium and large size was found for retailer.

**Table 3: Degrees of value addition by intermediaries**

Intermediaries	Price difference (Tk/80 leaf)			Cost (Tk/80 leaf)	Margin (Tk/80 leaf)			Degree of value addition (%)		
	Small	Medium	Large		Small	Medium	Large	Small	Medium	Large
Paikar (local market)	5.18	7.94	7.98	2.65	2.53	5.29	5.33	48.84	66.62	66.79
Paikar (Dhaka market)	5.1	8.39	7.81	2.17	2.96	6.22	5.64	57.70	74.14	72.22
Retailer	5.38	11.59	20.3	2.78	2.6	8.81	17.52	48.33	76.01	86.31

Degree of value addition (%) = Margin (Tk)\*100/Price difference (Tk)

## CONCLUSIONS

Betel leaf is a profitable business, and in the study area, a noticeable number of farmers are directly dependent on betel leaf production for their livelihood. Betel leaf is most beneficial in 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> years of production. But, there is a massive difference between the producers and consumers price which may force farmers for shifting betel leaf cultivation. Average per hectare production in the study area is lower than the national level also. It is clear that the existing market in the area is not well developed. As a result, farmers aren't getting sensible price. Considering this, policy should be taken for the minimization of this price gap and increase the producers share to the consumer price.

### Limitations of the study

The major limitations faced for this study were lack of adequate time and necessary funding for conducting the study. The authors faced difficulties from the intermediaries because they thought that the investigator could be an agent of the government authority. So, the intermediaries were afraid of losing their income through imposition of income tax. The absence of written records among the intermediaries left the researcher to rely upon the memory of the respondents. Result with large sample may differ to some extent from this study.

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