



MARKET IDENTIFICATION, OPPORTUNITIES, AND PROFITABILITY FOR THE SELECTED SEASONAL FRUITS IN THE CHITTAGONG HILL TRACTS AREA OF BANGLADESH

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ABSTRACT

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The study attempts to analyze suitable markets, market opportunities, and the estimation of the profitability of the selected seasonal fruits for the market intermediaries in Chittagong hill tracts of Bangladesh. The study was conducted at the CHT region such as; Bandarban and Rangamati district and some parts of the Chattagram region to document the socio-economic profile of the market actors of selected fruits and identify the suitable market opportunities and profitability of those fruits in the market. The chosen samples included 86 market actors. In the study area combined, 90% of Aratdar took formal education among all the market actors. In the case of education, 35% of market actors were found who have the level of education from primary to SSC, and 30% had primary education, 29% intermediaries were found to have finished their SSC level. The frequent and common variety sent to various markets was the Rangui variety of mango as the productions of other types were not more to supply. It was also observed that other fruits like jackfruit and litchi were sold more in the local market than supplying it to the distant market. When estimating growers' share, the study found the dominant channel for mango, jackfruit, and litchi to be the same (farmer- Faria-consumer), 64%, 38%, and 57%, respectively. The efficient marketing channel for mango (2.17) was (farmer-Bepari-Aratdar-retailer-consumer). For jackfruit, (farmer-Bepari-Aratdar-consumer) was found to have an efficient channel (1.27), and for litchi, (farmer-Faria-consumer) had the highest marketing efficiency (2.00).

Contribution/Originality: There is a dearth of studies regarding the marketing system and efficiency of seasonal fruits in the hilly areas of Bangladesh. This study is one of the few studies which identified the marketing channel, opportunities and profitability of the seasonal fruits for the market actors in the hilly areas of the Chattagram region of Bangladesh.

1. INTRODUCTION

The Chittagong Hill Tract, in southeastern Bangladesh, is the only sizeable hilly region in the country. They encompass an area of 13,184 square kilometers, with 92% highland, 2% medium highland, 1% medium lowland, and 5% residential areas and bodies of water. The CHT has roughly 1.35 million people, with about 51% indigenous people living in the frequently isolated upland areas [1].

For the past decade, mango, jackfruit, litchi, papaya, and watermelon have been the fruits of choice for mass-scale production in Bandarban, Rangamati, and Khagrachhari. The area has turned into a seasonal fruit hub with vast potentiality for expanding a food-processing sector. However, there is still a reliance on a centuries-old practice of intermediaries in the fruit trade [2]. These dealers go out to the cultivators a few weeks before harvest to negotiate prices for all products. They transport the produce to cities, where it is sold to smaller vendors. This strategy restricts the options available to farmers. At the same time, urbanites continue to charge exorbitant rates, implying that a significant portion of the fruits' value is pocketed somewhere along the road [2].

Fruit growers make a sizeable contribution to fruits production. Low volumes (minimal marketable surplus), poor quality, inconsistent supplies, and other factors limit their access to formalized markets. Simultaneously, local markets for the products are limited, forcing them to sell their products in far-flung urban and export markets, adding to their expensive transportation and marketing costs. Intermediaries such as assemblers, wholesalers, sub-wholesalers, commission agents, and retailers control existing supply chains. Producers can get as little as one-third to one-half of the final price in some instances, reflecting substantial marketing costs and margins [3]. Institutions such as cooperatives and commodity associations reduce marketing and transaction costs and risks by providing "markets" to the producers at their doorsteps. Transforming smallholder self-sustaining (non-market-oriented) agriculture into dynamic market-oriented sectors can create multiplier effects towards other sectors. This transition can enhance the non-farm sector by creating jobs and boosting income. Backward and forward production linkages and linkages emerging from improved revenues in the agricultural and non-farm sectors are examples of linkages. Presently, the rising demand for these seasonal commodities is allowing producers, particularly smallholder farmers, to diversify into commodities with a significant possibility of increased returns on land, labor, and capital.

Nevertheless, due to a lack of access to inputs and outputs, capital, technology, extension services, skills, natural resources (land, water), and other factors, there is concern regarding smallholder producers' ability to participate in market-oriented production [3]. So, identifying the suitable markets, market opportunities, and the estimation of the profitability of the selected seasonal fruits will reveal the market advantages for the market actors eventually. In light of the factors mentioned earlier, the current study was conducted for the three significant seasonal fruits (mango, jackfruits, and litchi) with the following purposes in mind.

- i. To document the socioeconomic profile of the market actors in the study area.
- ii. To identify the suitable market, marketing opportunities, and profitability for those fruits in the market.

2. REVIEW OF THE LITERATURE

As many researchers analyzed the marketing chain of fruits, identification of marketing channel, and the crucial problems affecting the market intermediaries, this study, in particular, addressed the marketing channel for the marketing intermediaries, marketing opportunities, and profitability across different chains in the study areas.

Some studies dealt with the marketing performances, marketing margin of fruits, growth in output, and trend analysis of major fruits in the CHT region [4-6]. Other studies found the production and growth rate of fruits, marketable and marketed surplus of fruits, socio-economic status of mango producers, etc. [7-9].

Tadesse, in his study, evaluated the marketing system for fruits, identification of marketing channels, quantification of marketing cost, and margin for fruits. He also suggested an apposite policy to develop the fruits marketing system in Ethiopia [4]. Marketing performance assessment for fruits plays a significant part in an ongoing or future fruit development plan to promote growth, economic development, food security, and poverty alleviation [4]. Market actors play a crucial role in ensuring a smooth marketing system, and their role is undoubtedly significant in the market development of any commodity. Dewan [7] in her study, found four types of intermediaries involved in the fruit marketing system. Her study revealed that the production growth rate for mango was highest in the study area, whereas banana records the negative growth rate in the hilly area [7]. Farmers with limited resources invest less in farming inputs such as insecticides and fertilizers, resulting in poorer

yields and inferior quality goods Aujla, et al. [5]. Aujla, et al. [5] found that due to a lack of storage and transportation facilities, 25-40% of post-harvest losses occurred, reducing supply and putting increased pressure on pricing. Uddin, et al. [6] performed research on the output growth and trend analysis of significant fruits in the hilly areas of the Chattagram region. The study found out the factors which contributed to output growth, and it revealed that the area for all the fruits increased, and the highest increase was for guava and the lowest increase in area for jackfruit. The study recommends that to augment the growth rate of fruits, enhanced variety and management practices should be spread through special programs and reinforcing research and extension links in this region [6]. A lack of transportation, exploitation by intermediaries, and market information impeded the feasibility and profitability of AIVs businesses [10]. Producer groups were linked to formal and informal marketplaces through marketing models relevant to all actors in the value chain to overcome these flaws [10]. According to a cost-benefit analysis of mango production, ten mango cultivars are lucrative with amplified working capital and human labor development. Mango farming has a higher cost of harvesting, sorting, and grading than other crops. Although respondents agreed that the Rajshahi district is profitable in mango production, more research into different variables and characteristics is needed [9]. After reviewing all of the above studies, it can be noted that there is a shortage of adequate research in the Chittagong Hill Tracts on the marketing system of seasonal fruits. This study will address the research gap by identifying the marketing channel and profitability of the seasonal fruits for the market actors in the hilly areas of the Chattagram region of Bangladesh.

3. METHODOLOGY

3.1. Study Site Selection

Since choosing the study area is a crucial step, it largely depends upon the study's objectives. Based on the high concentration of fruits production and cultivation, the hilly areas, i.e., Bandarban and Rangamati districts, were chosen to fulfill the study purpose.

3.2. Sampling Techniques

Market intermediaries such as; Faria, Bepari, Aratdar, wholesalers, and retailers make up the population of this study. To accomplish the aim of the study, the researcher used stratified random sampling to obtain data from market actors. 86 intermediaries or market actors were selected randomly from Bandarban and Rangamati districts and the different parts of the Chittagong and Feni region of the country Table 1.

Table 1. Sample distribution of market actor.

Respondent	Bandarban			Rangamati			Chittagong & Feni zone			Total		
	Mango	Jackfruit	Litchi	Mango	Jackfruit	Litchi	Mango	Jackfruit	Litchi	Mango	Jackfruit	Litchi
Faria	4	1	1	3	2	1	0	0	0	7	3	2
Wholesaler	3	1	1	4	1	4	1	0	1	8	2	6
Retailer	6	1	2	5	2	4	1	0	1	12	3	7
Bepari	8	2	2	4	4	1	0	0	0	12	6	3
Aratdar	0	0	0	0	0	0	5	7	3	5	7	3
All	21	5	6	16	9	10	7	7	5	44	21	21

3.3 Collection of Data

The primary data were collected through personal interviews with the respondents using an interview schedule in the study. The researcher himself collected data from the market intermediaries such as; Faria, Bepari, Aratdar, wholesalers, and retailers. Primary data were collected from the hilly areas of the Chattagram region such as; Bandarban, and Rangamati districts and some parts of Chattagram city from May 2016 to August 2016.

3.3.1. Data Collection from Intermediaries

The intermediaries refer to those people who act between the fruits growers and consumers. The important intermediaries are 'Faria,' 'Bepari,' 'Aratdar,' 'Wholesaler,' and retailer. Information was collected on trade volume, marketing costs (depreciation on investment capital, interest on running capital, transport cost, commission, market toll, wastage, etc.), mode of sales, purchase and sale prices, price formation, gross and net margins, and marketing constraints, etc. For Bepari, Faria, Wholesaler, and retailers, similar methods were followed. Among these intermediaries, Bepari, and Wholesaler, they transport fruits to other districts in the country.

3.4. Data Analysis and Analytical Techniques

Data obtained from questionnaires and interviews were coded where appropriate, entered into a Microsoft EXCEL database system and analyzed using SPSS Statistical Software. Average and percentage ratios were estimated using the EXCEL sheet. Descriptive statistics were used to describe the variables.

3.4.1. Marketing Opportunities and Profitability for Market Actor

3.4.1.1. Marketing Cost of Market Actor

The marketing costs mainly include costs for various market operations like transportation, loading and unloading, market toll, rents, staff salary, electricity, generator cost, commission, wastage, depreciation, and other miscellaneous expenses. The items of the marketing costs vary with the type of intermediaries.

The Total marketing cost incurred by the farmers and intermediaries in a channel is estimated by the following formula:

$$C = C_f + C_{m1} + C_{m2} + C_{m3} + \dots + C_{mi}$$

C = Total cost of fruits marketing in a channel.

C_f = Cost paid by the producer when commodity moves.

C_{mi} = Cost incurred by the ith middlemen in buying and selling fruits in a channel. (I = 1, 2, 3.....n)

3.4.1.2. Marketing Margin of Market Actor

The following formula estimated the marketing margin:

Marketing Margin (Tk/kg) = Sales price (Tk/Kg) – Purchase price (Tk/Kg)

The following formula calculated the net marketing margins of the intermediaries (after physical losses):

Net marketing margin (Value Addition) = Sales price - (Purchase price + Marketing cost)

3.4.1.3. Marketing Performance

Marketing performance is evaluated using different measures of marketing efficiency as described by Shepherd [11]; Hugar and Hiremath [12] and Acharya and Agarwal [13]. The present study will investigate marketing efficiency by examining price spread, growers’ share, and Acharya’s methods for estimating efficiency. The methods for studying these estimates are given in the following.

Price spread

Price spread = Price paid by consumers – Price received by the growers

Grower’s share

Growers' share (percent) = $\frac{\text{Price received by the fruit growers}}{\text{Customers' price}} \times 100$

Acharya’s method for estimating marketing efficiency.

In this method, the marketing efficiency will measure using the following formula:

$$\text{Marketing efficiency} = \frac{\text{FP}}{(\text{MC} + \text{MM})}$$

Where,

FP = Prices received by the farmer.

MC = Total marketing cost.

MM = Net marketing margin.

4. RESULTS AND DISCUSSION

4.1 Socio-Economic Characteristics of Market Intermediaries

The analysis on this demographic characteristic highlighted that the average age of types of intermediaries was 37 years to 42 years. Age is a crucial factor in skill development and enhancing marketing decisions. Literate people can have better access to the relevant information regarding food and livelihood security. It is observed from the study that among the market actors, 72% of Faria had formal education while 28% were illiterate. Among wholesalers, 85% had formal education, and 15% were illiterate. Among retailers, 83% had formal education, and their education ratio was more between primary to SSC. In the case of Bepari, 80% had formal education, and they also had the same higher ratio of education level between primary to SSC like the retailer. The highest education ratio was observed for Aratdar, and the study revealed that 90% of Aratdar took formal education, and only 10% were illiterate (Table 2). In all categories of market intermediaries, Bengali and Chakma were the distinct groups. Bengali were more in number in all groups than any other ethnic group. The only exceptions were in the group of Bepari, where Bengali, Chakma, and Bawm communities had involved themselves in trade.

Table 2. Socio-demographic characteristics of market intermediaries.

Characteristics	Market Intermediaries				
	Faria	Wholesaler	Retailer	Bepari	Aratdar
Age (years)	37	42	42	41	41
Ethnic Characteristics (%)					
Bengali	57	69	83	60	100
Chakma	43	31	17	7	0
Marma	0	0	0	0	0
Bawm	0	0	0	33	0
Gender (in %)					
Male	100	100	100	100	100
Female	0	0	0	0	0
Marital Status (%)					
Single	0	15	22	20	0
Married	100	85	78	80	100
Level of education (%)					
Illiterate	29	15	17	20	10
Primary	43	23	22	20	40
Primary to SSC	29	31	33	33	50
SSC	0	31	28	27	0
HSC	0	0	0	0	0
Graduation or above	0	0	0	0	0
Family size (average)	5	5	5	5	5

4.2 Market Identification for Seasonal Fruits

Several market places were identified in the study areas where seasonal fruits were rigorously sold. In the case of mango for Bandarban, the local markets where Faria and Bepari would bring and sell their product was Bandarban Sadar market, Balaghata Bazar. The Bepari would bring his product were in different parts of Chittagong city: Satkania, Keranihat, Dohazari, Cox's Bazar, BRTC market, etc. Figure 1. The frequent and

common variety sent to various markets was the Rangui variety of mango as the productions of other types were not more to supply. It was also observed that other fruits like jackfruit and litchi were sold more in the local market than supplying it to the distant market. Farmer and the market actors could not profit, sending this to the other remote market as the marketing costs demand more for these fruits than increasing its production. In Rangamati, demand for mango variety like Amrapali was more as it produced more in number. But, this year, this variety meets up lesser need than the previous years as the productions were not higher to mention. So, the price was higher in the market for this variety.

There are other mango varieties that were sold in the local market, such as; Rangamati Banarupa Bazar, Ranirhat Bazar, Rauzan market, etc. This year the jackfruit and pineapple production were more in Rangamati than any other fruits. Market actors like Faria and Bepari were more in Ghagra Bazar for selling jackfruit and pineapple. Most of the fruit growers were found who would bring these fruits directly into the market to sell. The other suitable market for seasonal fruits (Specially Jackfruit and pineapple) from Rangamati was sent through Bepari in the market like Chittagong Amin market, Bohoddar hat Bazar, Firingi Bazar, BRTC market, etc. Some market actors (Specially Bepari), both from Bandarban and Rangamati, sold their fruits in the feni and Dhaka markets [Figure 1](#). Though this number was not so high, they would send more in this distant market if the market actors got some incentives.

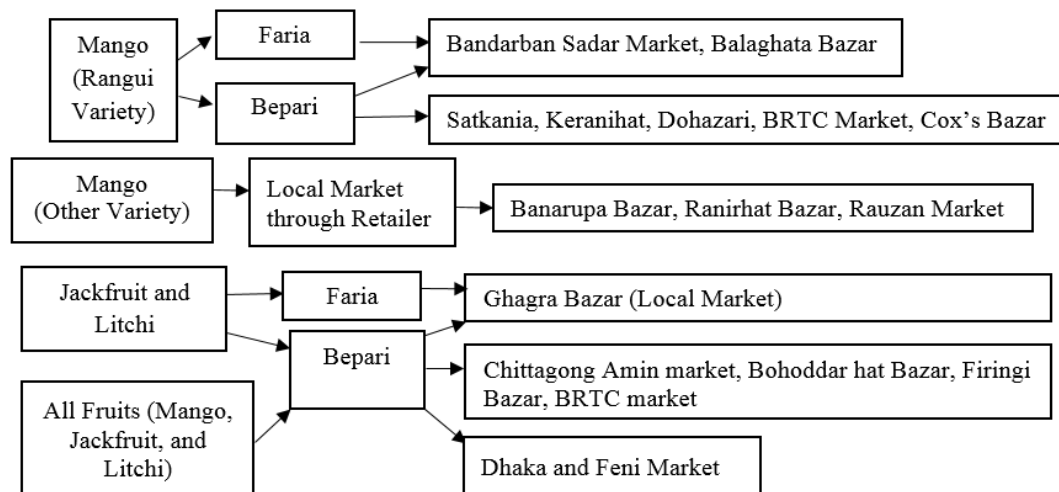


Figure 1. Identification of the market for the selected fruits by the market actors.

4.3. Marketing Performance and Opportunities

4.3.1. Marketing Cost of Market Intermediaries

Tables 3, 4, and 5 indicate different marketing costs related to the transaction of mango, jackfruit, and litchi by Faria, wholesaler, retailer, Bepari, and Aratdar. As in the study areas, most Farias sold their fruits to a distant place to get a better price. It was observed from Table 3 that, in the case of mango, among all the cost items, the market charge and fee were more significant than the other items. In the case of a wholesaler, retailer, and Aratdar, transportation cost was higher than the other items. In contrast, in the case of Bepari, depreciation cost was higher among all the items of marketing cost. In Table 4, except for wholesalers, the marketing cost of jackfruit was higher for Faria, retailer, Bepari, and Aratdar. Overall, the marketing cost of jackfruit was higher for Faria than the other market actors. In Table 5, it was observed that, in the case of litchi, the market fee and the toll were higher in amount for Faria and wholesaler than the other cost items. Also, the rent and maintenance fee was higher for retailers and Aratdar than the other items for litchi. From Table 5, it can be said that depreciation cost was higher than any other items for Bepari in the case of litchi marketing. Overall, it can be interpreted from Table 4 that the cost of litchi marketing was more significant for wholesalers than other market actors.

Table 3. Total Cost of Mango marketing of different market actors (Tk. /ton).

SL. No.	Cost Items	Market intermediaries				
		Faria	Wholesaler	Retailer	Bepari	Aratdar
1	Transportation	1692.86	4075	3275	925	2200
2	Packing	78.57	300	244.167	178	20
3	Loading/Unloading	0	494	620.84	292.42	202
4	Grading	0	62.5	92	10	24
5	Labor	9.28	441.25	560.84	597.25	130
6	Sweeper	0	307.5	280	2.75	0
7	Guard	0	62.5	41.67	0	0
8	Weight	48.57	0	0	11	0
9	Depreciation	657.15	2106.25	1612.50	1248.75	1960
10	Market Charge & Fee	2142.85	870.625	792.92	736.25	336
11	Rent	0	1000	925	144	1550
12	Electricity	0	435	398.34	38	480
13	Submit	225	21.25	68.34	0	0
14	Generator	0	71	105.67	5	50
15	Aratdar cost	0	34.37	22.92	75	0
16	Personal	203.57	211.37	220	115.34	140
17	Mobile	171.43	12.875	131.25	80.92	100
18	Others	0	0	0	0	0
	Total	5229.286	10614.25	9391.167	18601.2	7191

Table 4. Total Cost of Jackfruit Marketing of different market intermediaries (Tk/'00 no.)

SL. No.	Cost Items	Market intermediaries				
		Faria	Wholesaler	Retailer	Bepari	Aratdar
1	Transportation	350	450	633.33	783.33	842.857
2	Packing	0	0	0	0	0
3	Loading/Unloading	0	145	246.67	383.33	151.43
4	Grading	0	0	0	0	0
5	Labour	83.34	15	243.33	308.33	357.14
6	Sweeper	0	150	100	0	0
7	Guard	0	0	0	8.33	0
8	Weight	0	0	0	0	0
9	Depreciation	216.67	300	366.67	308.33	207.14
10	Market Tool	283.34	550	483.33	386.17	168.57
11	Rent	0	275	533.33	66.67	500
12	Electricity	0	475	166.67	0	307.14
13	Submit	150	25	16.67	0	0.72
14	Generator	0	225	23.33	0	26.43
15	Aratdar cost	0	0	0	0	0
16	Personal	183.34	200	141.67	113.34	146.43
17	Mobile	150	125	111.67	67.83	100
18	Others	0	0	0	0	0
	Total	1416.67	2935	3066.66	2425.67	2643.571

4.3.2. Marketing Margin of Market Intermediaries

In this study, the gross marketing margin of each trader was estimated by deducting the purchase price of fruits (mango, jackfruit, and litchi) from the sale price. In contrast, the net margin/profit component was estimated by deducting the marketing cost from the gross marketing margin. Table 6 represents the marketing margin of three mango varieties. The highest net margin for Amrapali variety was Tk. 24771 per ton, received by Faria, and their profits were higher than others. In the case of the Rangui variety, while the gross margin received by Bepari is higher than the other actors, the net margin or profit was more significant for the retailer (Tk. 10609 per ton) than the other actors. But in the case of the local variety of mango, the net margin was higher for Faria than the other market actors. It can be interpreted finally that, net margin of Bepari was smaller than the other market actors in all three varieties of mango. The same method was followed to estimate the marketing margin of jackfruit for market

intermediaries as mango intermediaries. Here, the net marketing margin of Faria was higher than other intermediaries when they supplied jackfruit in the market (Table 7), and the amount of net margin or profit was Tk. 1883 per 100 pieces. Here, the standard sizeable jackfruit was considered for estimation purposes. The same thing happened on litchi intermediaries. There were few differences in marketing margin between litchi intermediaries. According to the result, the highest net margin was received by Bepari for litchi trading (Table 8). The actual situation in other cases may be different because intermediaries handle the additional volume of fruits, and after that actual difference in marketing margin will be caused to happen.

Table 5. Total Cost of litchi marketing of different market intermediaries (Tk. / 000 no.)

SL. No.	Cost Items	Market intermediaries				
		Faria	Wholesaler	Retailer	Bepari	Aratdar
1	Transportation	175	200	46.43	183.34	216.67
2	Packing	37.5	44.17	34.28	45	38.33
3	Loading/Unloading	0	158.33	44.28	0	50
4	Grading	0	0	6.43	0	23.34
5	Labor	0	20.83	0	150	55
6	Sweeper	0	15	21.43	0	0
7	Guard	0	0	14.28	0	0
8	Weight	0	0	0	0	0
9	Depreciation	175	200	117.14	250	133.34
10	Market Toll and fee	225	258.33	214.28	175	216.67
11	Rent and Maintenance	0	300	250	0	416.67
12	Electricity	0	191.67	235.72	0	96.67
13	Submit	27.5	12.5	2.86	16.67	0
14	Generator	0	44.17	42.14	0	75
15	Aratdar cost	0	0	0	0	0
16	Personal	112.5	133.14	121.43	91.67	150
17	Mobile	110	97.5	102.86	108.34	116.67
18	Others	0	0	0	0	0
	Total	862.5	1667.5	1253.57	1020	900.68

Table 6. Marketing margin of different mango intermediaries (in BDT).

For Amrapali variety						
Sl. No.	Particulars	Market intermediaries				
		Faria	Wholesaler	Retailer	Bepari	Aratdar
a.	Purchase price	45000	55000	75000	40000	60000
b.	Sale price	75000	70000	90000	60000	75000
c.	Gross margin(b-a)	30000	15000	15000	20000	15000
d.	Marketing cost	5229.286	10614.25	9391.167	18601.2	7191
e.	Net margin (c-d)	24771	4386	5608.83	1399	7809
(For Rangui Variety)						
a.	Purchase price	25000	40000	40000	20000	40000
b.	Sale price	40000	55000	60000	40000	50000
c.	Gross margin(b-a)	15000	15000	20000	20000	10000
d.	Marketing cost	5229.286	10614.25	9391.167	18601.2	7191
e.	Net margin (c-d)	9770.72	4385.75	10608.83	1398.8	2809
(For Local variety)						
a.	Purchase price	30000	45000	50000	30000	0
b.	Sale price	50000	60000	70000	50000	0
c.	Gross margin(b-a)	20000	15000	20000	20000	0
d.	Marketing cost	5229.286	10614.25	9391.167	18601.2	0
e.	Net margin (c-d)	14770.72	4385.75	10608.83	1398.8	0

Table 7. Marketing margin of different jackfruit intermediaries (in BDT).

Market intermediaries	a. Purchase price (100 piece)	b. Sales price (100 pieces)	c. Gross margin(b-a)	d. Marketing cost	e.Net margin (c-d)
Faria	2000	5300	3300	1416.67	1883.33
Wholesaler	2800	6000	3200	3135	65
Retailer	5300	10000	4700	3233.33	1466.67
Bepari	2000	5000	3500	3280.67	219.33
Aratdar	5000	7000	2000	1843.571	156.43

Table 8. Marketing margin of different litchi intermediaries (in BDT).

Market intermediaries	Litchi Variety	a. Purchase price (100 piece)	b. Sales price (100 pieces)	c. Gross margin(b-a)	d. Marketing cost	e.Net margin (c-d)
Faria	China 3	2000	3500	1000	862.5	138
	China 2	1500	2500	1000	862.5	138
Wholesaler	China 3	2000	3800	1800	1667.5	133
	China 2	1200	3000	1800	1667.5	133
Retailer	China 3	3500	5000	1500	1254	246
	China 2	2500	4000	1500	1254	246
Bepari	China 3	1500	3000	1500	1020	480
	China 2	1200	2500	1300	1020	280
Aratdar	China 3	3000	4000	1000	900.68	99.32
	China 2	2500	3500	1000	900.68	99.32

4.4. Marketing Efficiency

Marketing efficiency is a measure of market performance. The movement of goods from producers to the ultimate consumers at the lowest possible cost consistent with the service desired by the consumers is termed efficient marketing [14]. Here, in case of estimating price spread, growers' share, and marketing efficiency, averages of prices of three mango varieties have been counted. For litchi, the China-3 type has been calculated for estimation purposes.

4.4.1. Price Spread

For measuring marketing efficiency, price spread is an important measure. According to the research result, the price spread was highest when mango was transferred by the channel [Farmer – Bepari – Aratdar (Chittagong market) – Retailer – Consumer], and the amount was TK. 32400. For comparing different channels, the price spread of all other possible channels was calculated and presented in Table 9. The price spread was highest for jackfruit marketing in the (Farmer – Faria – Retailer – Consumer) channel (Tk.8000 per 100 pieces). For litchi marketing, the highest price spread was seen in the [Farmer – Bepari – Aratdar (Chittagong) – Retailer (Chittagong) – Consumer] channel, which was Tk. 3500 per 1000 pieces.

4.4.2. Grower's Share

Grower's share is another important measure of marketing efficiency. Results showed that the grower's share was highest in the (Farmer – Faria – Consumer) channel during mango marketing (63.64 %) (Table 10). During jackfruit supply, fruit growers also share highest in (Farmer – Faria– Consumer) channel which was 38%. And the same case happened for the litchi growers. Litchi growers got the largest share in the (Farmer – Faria – Consumer) channel (57 %). So, for all the three fruits, the common channel where growers' share ranked high was (Farmer – Faria – consumer channel) (Table 10).

4.4.3. Acharya's Method for Estimating Marketing Efficiency

The performance of marketing was assessed based on Acharya's formula of marketing efficiency. Results (Table 11) showed that for mango marketing, the most efficient marketing channel was [Farmer – Bepari – Aratdar (Chittagong market) – Retailer – Consumer] and that was 2.17. In the case of jackfruit marketing, the most efficient channel was [Farmer – Bepari – Aratdar (Chittagong market) – Consumer (Chittagong)], and it was 1.27 Table 11. For litchi marketing, the efficient channel was (Farmer – Faria – Consumer), and the marketing efficiency was 2.00 higher than the other channel.

Table 9. Price Spread in marketing channel of fruits (mango, jackfruit, and litchi).

Marketing channel	Price received by fruit growers (in BDT)	Price paid by consumers (in BDT)	Price Spread (in BDT)
Mango per ton			
Farmer – Faria – Consumer	35000	55000	20000
Farmer – Faria – Retailer – Consumer	35000	73000	38000
Farmer – Bepari – Aratdar (Chittagong market) – Retailer – Consumer	30000	73000	43000
Farmer – Bepari – Wholesaler (Feni market) – Retailer – Consumer	30000	62000	32000
Farmer – Bepari – Consumer	30000	50000	20000
Jackfruit per 100 pieces			
Farmer – Bepari – Consumer	2000	6000	4000
Farmer – Bepari – Aratdar (Chittagong market) – Consumer (Chittagong)	2000	7000	5000
Farmer – Faria – Retailer – Consumer	2000	10000	8000
Farmer – Faria – Consumer	2000	5300	3300
Litchi per 1000 pieces			
Farmer – Faria – Consumer	2000	3500	1500
Farmer – Faria – Retailer – Consumer	2000	5000	3000
Farmer – Bepari – Consumer	1500	3000	1500
Farmer – Bepari – Aratdar (Chittagong) – Retailer (Chittagong) – Consumer	1500	5000	3500
Farmer – Bepari – Aratdar (Chittagong) – Consumer	1500	4000	2500

Table 10. Growers share (%) in marketing channel of fruits (mango, jackfruit, and litchi).

Marketing channel	Price received by fruit growers (in BDT)	Price paid by consumers (in BDT)	Growers Share (%)
Mango per ton			
Farmer – Faria – Consumer	35000	55000	63.64
Farmer – Faria – Retailer – Consumer	35000	73000	47.95
Farmer – Bepari – Aratdar (Chittagong market) – Retailer – Consumer	30000	73000	41.09
Farmer – Bepari – Wholesaler (Feni market) – Retailer – Consumer	30000	62000	48.38
Farmer – Bepari – Consumer	30000	50000	60
Jackfruit per 100 pieces			
Farmer – Bepari – Consumer	2000	6000	33.33
Farmer – Bepari – Aratdar (Chittagong market) – Consumer (Chittagong)	2000	7000	28.57
Farmer – Faria – Retailer – Consumer	2000	10000	20
Farmer – Faria – Consumer	2000	5300	37.74
Litchi per 1000 pieces			
Farmer – Faria – Consumer	2000	3500	57.14
Farmer – Faria – Retailer – Consumer	2000	5000	40
Farmer – Bepari – Consumer	1500	3000	50
Farmer – Bepari – Aratdar (Chittagong) – Retailer (Chittagong) – Consumer	1500	5000	30
Farmer – Bepari – Aratdar (Chittagong) – Consumer	1500	4000	37.5

Table 11. Acharya's marketing efficiency of various channels in fruits (mango, jackfruit, and litchi) marketing.

Marketing channel	Price received by fruit growers (in BDT)	Total marketing cost (in BDT)	Net Marketing margin (in BDT)	Marketing Efficiency
Mango per ton				
Farmer – Faria – Consumer	35000	5229.286	16437.48	1.62
Farmer – Faria – Retailer – Consumer	35000	9391.167	8942.16	1.91
Farmer – Bepari – Aratdar (Chittagong market) – Retailer – Consumer	30000	9291.08	4549.98	2.17
Farmer – Bepari – Wholesaler (Feni market) – Retailer – Consumer	30000	12868.87	5545.66	1.63
Farmer – Bepari – Consumer	30000	18601.2	1399	1.49
Jackfruit per 100 pieces				
Farmer – Bepari – Consumer	2000	3280.67	219.33	0.57
Farmer – Bepari – Aratdar (Chittagong market) – Consumer (Chittagong)	3500	2562.12	187.88	1.27
Farmer – Faria – Retailer – Consumer	3650	2325	1675	0.91
Farmer – Faria – Consumer	2000	1417	1883	0.61
Litchi per 1000 pieces				
Farmer – Faria – Consumer	2000	862.5	137.5	2.00
Farmer – Faria – Retailer – Consumer	3650	2325	1675	0.91
Farmer – Bepari – Consumer	1500	1020	480	1.00
Farmer – Bepari – Aratdar (Chittagong) – Retailer (Chittagong) – Consumer	1500	1253.57	246.43	1.00
Farmer – Bepari – Aratdar (Chittagong) – Consumer	1500	900.68	99.32	1.50

5. CONCLUSION

The majority of the market actors depends mainly on agricultural activities and engage themselves thoroughly in the production and marketing of seasonal fruits. The most common mango variety transported to various markets was the Rangui type, as the displays of other varieties were in short supply. Other fruits, such as jackfruit and litchi, were also more popular at the local market than in the distant market. For mango (Rangui variety), the retailer's net margin or profit was more significant than the other actors. In contrast, the net marketing margin of Faria was higher when they supplied jackfruit in the market. Also, the highest net margin was received by Bepari for litchi trading. The most efficient marketing channel for mango was "farmer-Bepari-Aratdar-retailer-consumer." Whereas for jackfruit, (farmer-Bepari-Aratdar-consumer) was found to have an efficient channel, and for litchi, (farmer-Faria-consumer) had the highest marketing efficiency.

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