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# AN ANALYSIS OF COST OF PRODUCTION OF BANANA AND PROFITABILITY AT NARSINGDI AND GAZIPUR DISTRICT IN BANGLADESH

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## ABSTRACT

The economy of Bangladesh is traditionally agricultural. The most of her inhabitants directly or indirectly are involved in agricultural activities for their livelihood. Agriculture has a great contribution to the Gross Domestic Product (GDP) of the country. Earlier more than 50 percent of GDP came from this sector. When industrialization started the activities of the population started diversification towards different sectors. As a result, the contribution of the agriculture sector is slowly reducing and now reached 19 percent share of GDP. Banana is one of the major crops of Bangladesh. It occupies an important position among the fruits of the country not only for its highest production among the fruits but also for its increasing popularity to many farmers as an economic crop. The present acreage of banana covers about 40 percent of the area and 27 percent fruit production of the country. Bangladesh is one of the most popular country of the world more than 140 million people living in 147570 square km, which require about 23.08 million tons of food grains. Over the year, there has been an average food deficit of about 4 million tons annually, which was met through food aid and import. Study was based on data collected from 40 farmers from 2 districts namely Gazipur and Narsingdi of Bangladesh. Results of the study revealed that, cost of production of banana per hectare as maximum, minimum and mean were tk. 254000, tk. 20400 and tk. 231100 respectively. The gross returns obtained as maximum, minimum and mean were tk. 551000, tk. 521000 and tk. 529000. The net returns as maximum, minimum and mean were tk. 347000, tk. 278000 and tk. 297900. The study shown that gross marketing margin of Aratdar, wholesaler, Petty trader, Retailer was tk. 25, tk. 40, tk. 30 and tk. 50 respectively per eighty banana. The net marketing margin of Aratdar, wholesaler, Petty trader, Retailer was tk. 14.08, tk. 28, tk. 53, tk. 17.50 and tk. 39.60 respectively per eighty bananas. Marketing cost of the Aratdar, wholesaler, Petty trader, Retailer was tk. 15.92, tk. 11.47, tk. 12.50 and tk. 10.40 respectively per eighty bananas. Most of farmer faced problems on lack of fertilizer, insufficient labor and lack of subsidy. The objectives of the study were to estimate the cost of production, returns of banana and to identify the marketing channels of banana.

## KEYWORDS

Food security, human resource development, macro economics, poverty alleviation.

## 1. INTRODUCTION

Bangladesh has been a predominantly an agrarian economy since time immemorial. More than 80 percent of its population directly or indirectly depends on agriculture. About 20.87 percent of gross domestic product (GDP) is derived from agriculture and two third of total employment comes from agriculture (BBS, 2008).

Banana (*Musa accuminata* L.) belongs to the family Musaceae. The edible banana believed to have originated in the hot, tropical regions of south-east Asia. It is one of the oldest fruits known to mankind. Banana plants are the largest plants on earth without a woody stem. Banana is the most delicious fruit used as subsidiary food. It is consumed as table purpose as well as culinary fruit, its leaves are universally used for serving meals in South India and chopped banana stems are used as cattle feed. Some species of banana yield fiber, which is used for making ropes. The tip of inflorescence is cooked as a vegetable in some places. The plant is also used for decoration purpose in wedding, festivals and fairs. It is used as raw material in industries for preparation of banana powder, chips, juices and beer. The juice of banana stem is used in making paper bond, tissue paper etc. In Bangladesh Bogra, Narsingdi, Monshigonj, Dinajpur, Rangpur, Meherpur, Kushtia, Jessore, Mymensingh, Barisal Chittagong hill tracts etc. are leading banana producing districts (BBS, 2008). There are more than 40 varieties available in Bangladesh. The important varieties are: Amritsagar, Sabri (Malvog), Jahaji/ Singapuri/ Nepali/ Kabuli (dwarf), Ganasundari, Mehersagor, Agnisshor, Kabri Champa/ chinichampa, Japkathali Atekola, Verarvog, Choalpoush, Behula, Mondira, Bierbati etc. The ripen banana fruit contains 70 percent moisture, 27 percent carbohydrates, 1.20 percent protein, 0.09 percent ash, 0.50 percent crude fiber and 0.30 percent fat. In addition to this, it also contains 290 ppm phosphorus, 120 ppm ascorbic acid, 80 ppm calcium, 7 ppm niacin, 6 ppm iron, 0.5 ppm riboflavin and 0.5 ppm thiamine. It also supplies 104 calories of energy.

Bananas have no fat, cholesterol or sodium. Bananas are essential for athletic and fitness activity because they replenish necessary carbohydrates, glycogen and body fluids burned during exercise. Ref. Banana is also a very important staple food for many developing countries for their food security.

## 2. REVIEW OF LITERATURE

The number of small scale commercial banana farming has currently been decreasing in different areas in Bangladesh. In the past banana was cultivated in the homestead areas and some farmers of the country cultivating banana as a field crop. Only a few economic studies on banana cultivation have so far been conducted in this country. However, an attempt has been made in this chapter to review some of the studies related to the present study.

Subaiah *et al.* (1980) found in their study that a high yield of banana could be achieved from intercropping with green and black gram. The findings on the economics of intercropping with banana revealed that net return was relatively higher with green gram followed by black gram.

Mohendra and Das (1981) carried out a research and reported in their study that the shooting and harvesting period of banana was significantly influenced by different spacing and intercrops, namely onion tomato and capsicum. They found that the earliest shooting and harvesting was favoured by onion by followed by chili.

Haque (1988) conducted a research at Bangladesh Agricultural University Mymensingh during October to November 1988. He examined the economic performance of banana production.

Begum (2001) conducted a study on production and marketing of banana of three union of Sirajgong Upazilla major Bogra district. The reported banana marketing in the study area was Farmer, Faria, Beparies, Wholesaler-1, Wholesaler-2 and Retailer were Tk. 6.00, 12.00, 6.50 and 9.50 respectively.

A general survey of the relevant literature reveals that a few studies on banana production have been conducted in different areas of Bangladesh. But study on marketing of banana in Bangladesh is scanty. Therefore, the present study attempts to analyze the production and marketing of banana in some selected areas of Narsingdi and Gazipur district.

## 3. STATEMENT OF THE PROBLEM

Bangladesh is an agricultural country. Most of the population of Bangladesh is directly or indirectly dependent on agricultural sectors and most of the employment sectors are circled in agricultural base. So we should give more emphasis to the agricultural sector. In our country many kinds of product is cultivated, some are directly used for food, some are used in industrial sectors and so many kinds. I prefer to analyze the cost of inputs of the different agricultural product and how the corresponding cost of the production can be economic model. In case of this research I try to give emphasize on the Economic Modeling of the Cost of Inputs for Banana Production.

## 4. OBJECTIVES

The specific objectives were the followings-

- i) To estimate the costs and returns of banana.
- ii) To identify the marketing channels and marketing cost incurred by the producer.
- iii) To identify the problems encountered in production and marketing of banana.

## 5. LIMITATION OF THE STUDY

Several limitations had taken place in this study. Among them, the following were worth mentioning:

1. Personal barriers like inability to understand some agriculture terms created a few problems the researcher.
2. The survey was conducted in the field. However, due to confidential reason, all necessary information was not available.
3. It was difficult to collect data from the traders for this study because they were afraid of income tax.
4. Another problem was the initial non-cooperation of the respondents.

However, this problem was overcome through persuasive explanation with the respondents of the study area.

## 6. RESEARCH METHODOLOGY

### 6.1. AREA, POPULATION AND SAMPLE SIZE

Bananas are mainly grown in the districts of Narsingdi, Gazipur and Tangail in Bangladesh. Gazipur and Narsingdi were selected purposively as the study area. Kapasia upazilla of Gazipur and Monohordi upazilla of Narsingdi were purposively selected as the study area. Two villages were purposively selected from each of the selected upazilla. Banana cultivators of these selected villages constituted the population farmers of the study. Ten cultivators were randomly selected from each selected village. Thus a total of 40 banana farmers constituted the sample farmers for the study.

TABLE 1: STUDY AREA AND SAMPLE FARMERS

Farmers Type	Districts	Upazilla	No. of Villages	No. of sample farmers
Banana	Narsingdi	Monohordi	2	20
	Gazipur	Kapasias	2	20
	Total		4	40

Source: Field survey, 2013.

All the available banana ten wholesalers involved in marketing were selected from nearby markets of the selected farmer's villages. Ten retailers were purposively selected from nearby markets of the selected farmer's villages.

### 6.2. APPROACH AND ANALYTICAL TOOLS

Three interview schedules containing direct questions with appropriate scales were prepared according to the objectives of the study and collected data from three types of respondents, viz. cultivators, wholesalers and retailers. Each of the three draft schedules were pre-tested for necessary corrections, additions and adjustments before going for final data collection. Validity and reliability of some scales were properly determined. Data were collected by the investigators during the period of March to April 2013 by face to face interviews with farmers, wholesalers and retailers. Identification and determination of chemical fertilizers and pesticides were done by asking direct questions to the respondents. From the responses of the respondents the rate of fertilizers and pesticides used by the farmers were determined.

### 6.3. DATA MANAGEMENT AND ANALYSIS

Data collected from the respondents were compiled, tabulated and analyzed in laboratory in accordance with the objectives of the study. Statistical package for social science (SPSS) software is used for data analysis. Statistical measures such as number and percentage distribution, range, average, mean difference were used whenever necessary.

## 7. SOURCES OF DATA

The study is involved in collection of data both from the primary and secondary sources. Different types of data and their sources are discussed under the following heads:

**7.1 PRIMARY DATA**

Primary data have been collected through field survey. One set schedule of questionnaire was used for the respondents. The data thus collected have been subsequently processed, tabulated and analyzed for the purpose of the study.

**7.2 SECONDARY DATA**

The secondary sources include govt. publications; annual reports on banana cultivation, seminar papers, journals, published and unpublished thesis, and topic related various books, web site etc.

**8. RESULTS AND DISCUSSION**

The results of the present study are discussed in the following section:

This section deals with the socio-economic characteristics of the sample farmers. An effort has, therefore, been made in this section to describe briefly some of the basic socio-economic characteristics.

**TYPE OF THE SAMPLE FARMER**

It was observed from the table that small, medium and large farmer was 45, 40 and 15 percent respectively. Most of the farmer was small type as 45 percent at study area.

**TABLE 2: TYPE OF THE FARMER**

Type of farmer	Frequency	Percent
Small	18	45.0
Medium	16	40.0
Larger	6	15.0
Total	40	100.0

Source: Field survey, 2013

**AGE CATEGORY OF THE RESPONDENTS**

The respondents of the study area were categorized on the basis of their age groups viz. young aged (up to 30) years, middle aged (31-40) years, adult aged (41-50) years and above (>51) years old aged. In table 2, young, middle, adult and old aged respondents were 27.5, 27.5, 25.00 and 20.00 percent respectively. Young and middle aged people more involved in banana production.

**TABLE 3: AGE DISTRIBUTION OF THE SAMPLE FARMERS IN THE STUDY AREA**

Type of farmer	Age of The farmer	Frequency	Percent
Young aged	up to 30	11	27.5
Middle aged	31-40	11	27.5
Adult aged	41-50	10	25.0
Old aged	more than 50	8	20.0

Source: Field survey, 2013.

**EDUCATION STATUS OF THE SAMPLE FARMER**

It was observed that, primary level educated farmer was 55 percent. Secondary and higher secondary educated farmer was 44.5 and 2.5 percent respectively. Highest rate of educated farmer was at primary level.

**TABLE 4: EDUCATION STATUS OF THE FARMER**

Type of education	Level of education	Frequency	Percent
Primary	1-5	22	55.0
Secondary	6-10	17	42.5
Higher secondary	more than 11	1	2.5

Source: Field survey, 2013.

**PROBLEM FACED BY THE FARMER**

Most of the farmer was covered with problems. From table it was observed that 25 percent farmer faced the problem for fertilizer and pesticide. It is the most vital problem. Second vital problem was lack of subsidy as 20 percent. Others problems were lack of labor, high price of pesticide and fertilizer, insufficient of finance and lack of knowledge to identify the diseases as 17.50, 12.5, 7.5 and 7.50 percent respectively.

**TABLE 5: PROBLEM FACED BY THE FARMER**

Problems	Frequency	Percent
Lack of Subsidy	8	20.0
Lack of Pesticide and Fertilizer	10	25.0
Lack of Labour	7	17.5
High price of Pesticide and Fertilizer	5	12.5
Lack of Knowledge to identify Disease	7	17.5
Insufficient of Finance	3	7.5

Source: Field survey, 2013.

**COST OF PRODUCTION OF BANANA OF 1HECTARE LAND**

From the table we may say that, maximum, minimum and mean land cost was tk. 100000, tk. 80000 and tk. 89825 respectively. Here most frequent cost was tk. 90000 by 6 farmers among 40 farmers. Maximum, minimum and mean of land preparation cost was tk. 38000, tk. 32000 and tk. 34812 respectively. Among 40 farmers 8 farmers shown land preparation cost was tk. 34000. Maximum, minimum and mean of fertilizer cost was tk. 20000, tk. 15000 and tk. 17462 respectively. Most frequent fertilizer cost was tk. 18000 by 7 farmers. Maximum, minimum and mean of insecticide cost was tk.7200, tk.5700 and tk.6357 respectively. Most frequent insecticide cost was tk. 6500 by 9 farmers. Maximum, minimum and mean of weeding and earthing up cost was tk. 37000, tk. 36000 and tk. 33552 respectively. Most frequent insecticide cost was tk. 34000 by 9 farmers. Maximum, minimum and mean of staking cost was tk. 40000, tk. 32000 and tk. 35425 respectively. Most frequent staking cost was tk. 35000 by 9 farmers. Maximum, minimum and mean of total cost of production was tk. 254000, tk. 204000 and tk. 231100 respectively. Most frequent cost of production was tk. 238600 by 2 farmers. Maximum, minimum and mean of total return was tk. 551000, tk. 521000 and tk. 529000 respectively. Most frequent total return was tk. 521000 by 4 farmers. Maximum, minimum and mean of net return was tk. 347000, tk. 278000 and tk. 297900 respectively.

TABLE 6: COST OF PRODUCTION OF BANANA OF 1HECTARE LAND

Name of variable	Frequency (Mode)	Taka/ha	Minimum	Maximum	Mean
Land cost	6	90000	80000.00	100000	89825
Land preparation cost	8	34000	32000.00	38000.00	34812
Sucker cost	6	6000	5000.00	6400.00	56425
Planting cost	7	5500	5000.00	6000.00	54950
Fertilizer cost	7	18000	15000.00	20000.00	17462
Insecticide cost	9	6500	5700.00	7200.00	6357
Irrigation cost	11	2500	2200.00	3000.00	2523
Weeding & Earthing up cost	9	34000	36000.00	37000.00	33552
Stalking cost	9	35000	32000.00	40000.00	35425
Total production cost	2	238600	204000	254000	231100
Selling price of banana	10	530000	520000	550000	52755
By product selling price	10	1500	1000.00	2000.00	1447
Total return	4	521300	521000	551000	529000
Net return	0	0	278000	347000	297900

Source: Field survey, 2013.

**PER SORI COST OF THE FARMER**

From the table we saw that, per sori cost of banana by small, medium and large farmer was maximum tk. 144, tk. 159 and tk. 152 respectively and minimum as tk. 93, tk. 98 and tk. 99 respectively. The mean value of per sori cost was tk. 123.54, tk. 126.91 and tk. 125.99 respectively.

TABLE 7: SORI COST OF SAMPLE FARMER

Type of farmer	Mean	N	Minimum	Maximum
Small	123.54	18	93	144
Medium	126.91	16	88	159
Large	125.99	6	99	152
Total	125.25	40	88	159

Source: Field survey, 2013.

**GRAPHICAL REPRESENTATION OF COST OF PRODUCTION OF BANANA (1 HA)**

The graph shown that most costed variable was land cost. Second most costed variable was stalking cost then weeding and earthing up and land preparation cost was almost same. The lowest costed variable was irrigation.

FIG 1: GRAPHICAL REPRESENTATION OF TOTAL COST

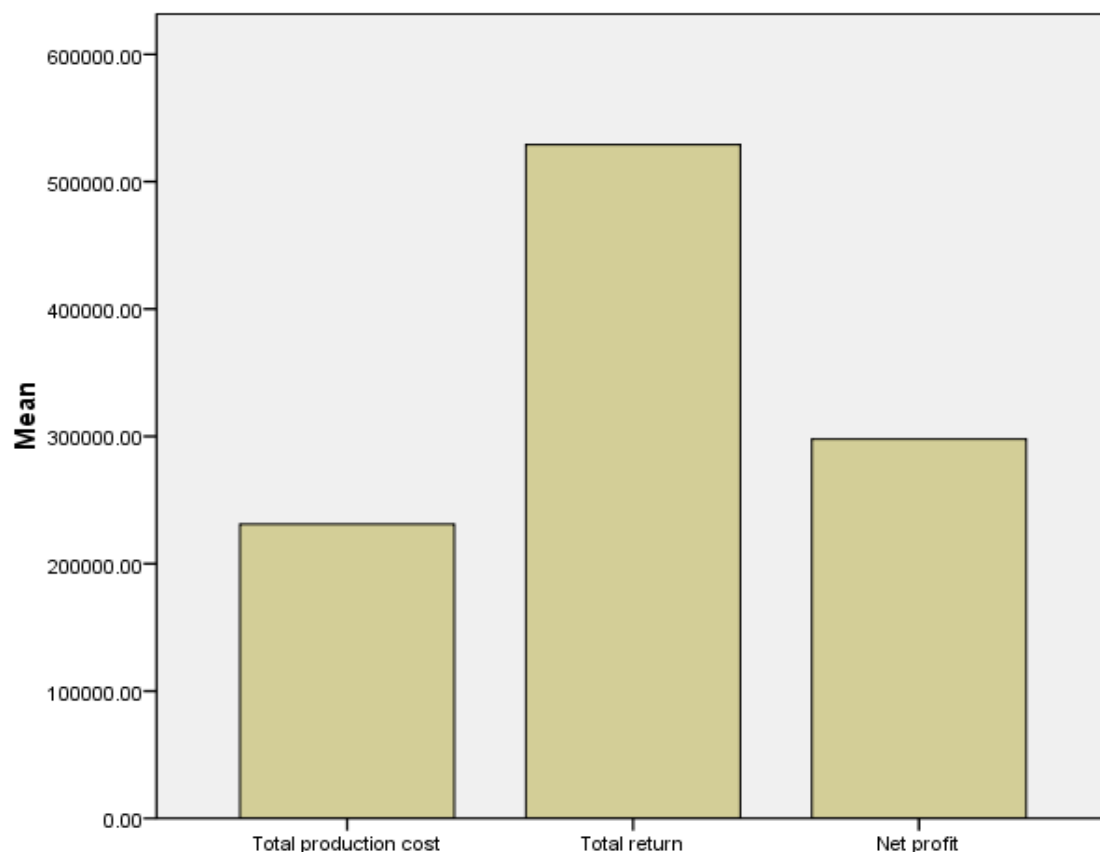
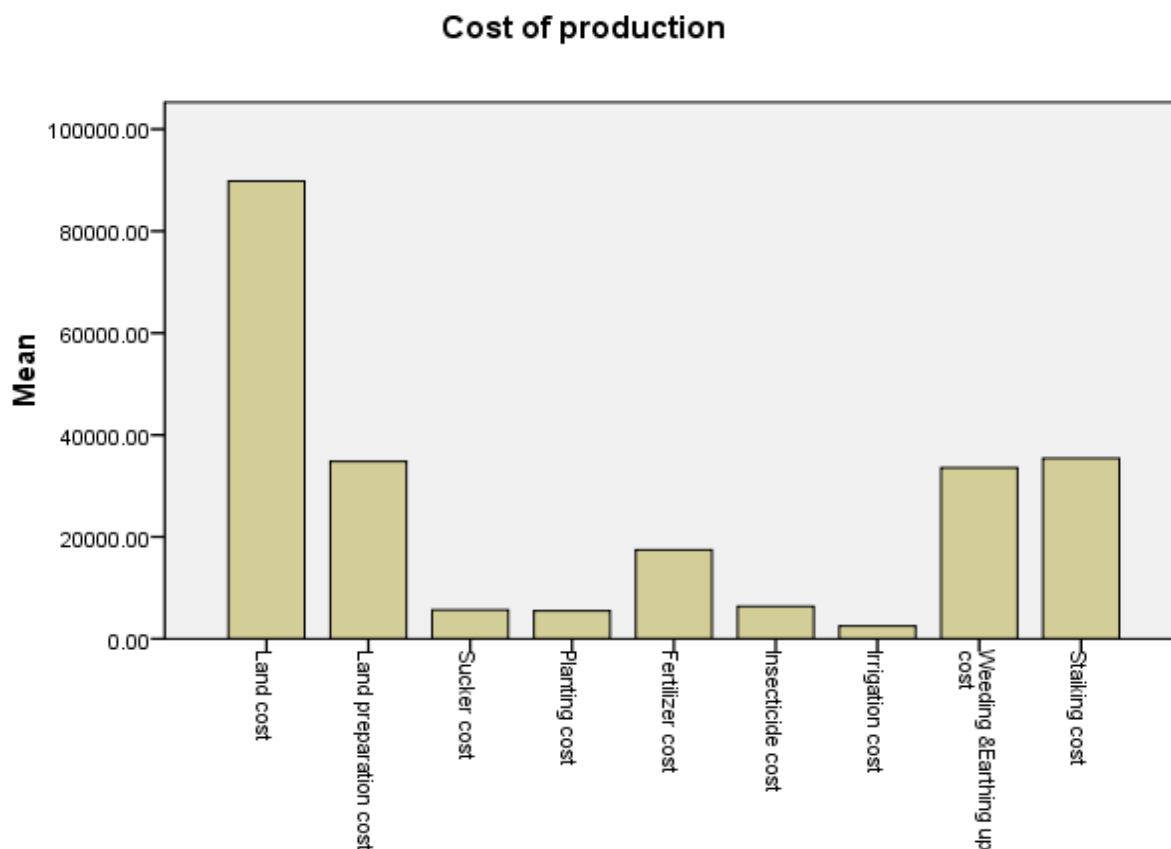


FIG 2: GRAPHICAL REPRESENTATION OF TOTAL COST, TOTAL RETURN AND NET PROFIT



It was observed from the graph that, the cost of production of 1ha. land was tk. 200000 up. Total return was more than tk. 500000 up. The net return was more or less tk. 300000.

## 9 CHANNELS OF BANANA MARKETING

Marketing channel is the process through which a product flows on its way to the ultimate consumers. A number of intermediaries were found in banana marketing channels. They were Aratdar, Petty trader, Wholesaler and Retailer. They performed the marketing function of buying and selling, assembling, grading, storage, transportation, risk bearing etc.

The typical model of banana marketing channels is discussed below:

Channel A: Producers→ Aratdar→ Retailer→ Consumer.

Channel B: Producers→ Wholesaler→ Retailer→ Consumer.

Channel C: Producers→ Petty trader→ Wholesaler→ Retailer→ Consumer.

Channel D: Producers→ Retailer→ Consumer.

Channel E: Producers→ Wholesaler→ Distant wholesaler→ Retailer→ Consumer.

### MARKETING MARGIN OF INTERMEDIARIES

Table shows that, petty trader purchased from farmers or from farias at Tk. 180 per eighty banana and sold to wholesalers at Tk. 210. Wholesaler purchased at Tk. 210 and sale at Tk. 250. Aratdar purchased at Tk. 255 and sale at Tk. 280. So, gross margin of aratdar, wholesaler, petty trader and retailer is Tk. 25, Tk.40, Tk. 30 and Tk. 50 respectively. Retailer is the highest gross margin earner.

TABLE 8: GROSS MARKETING MARGIN OF INTERMEDIARIES (Taka/eighty bananas)

Intermediaries	Purchase price	Sale price	Gross margin
Aratdar	255	280	25
Wholesaler	210	250	40
Petty trader	180	210	30
Retailer	280	330	50

Source: Field survey, 2013.

### NET MARKETING MARGIN OF INTERMEDIARIES

Table shows that the net market margin of aratdar, wholesaler, petty trade and retailer is tk. 14.08, tk. 28.53, tk. 17.50 and Tk. 39.60 respectively. Retailer achieved higher net marketing margin.

TABLE 9: NET MARKETING MARGIN OF INTERMEDIARIES (Taka/eighty bananas)

Intermediaries	Purchase price	Sale price	Gross margin	Marketing cost	Net margin
Aratdar	250	280	30	15.92	14.08
Wholesaler	210	250	40	11.47	28.53
Petty trader	180	210	30	12.50	17.50
Retailer	280	330	50	10.40	39.6

Source: Field survey, 2013.

**MARKETING COST OF BANANA INTERMEDIARIES**

From the table we observed that, on an average the marketing cost per eighty bananas was Tk. 16.62 where the share of transportation cost was the largest Tk. 3.85 and second largest Tk. 3.75 of total marketing costs. Marketing cost was the highest for Aratdar Tk. 20.15 per eighty bananas. Marketing cost for petty trader, wholesaler and retailer was Tk. 18.62, Tk. 13.02 and Tk. 10.68 respectively.

**TABLE 10: MARKETING COST OF BANANA FOR INTERMEDIARIES (per/eighty bananas)**

Cost of items	Aratdar	Petty trader	Wholesaler	Retailer	All average
Transportation	4.25	4.50	4.72	1.93	3.85
Loading and unloading	1.75	1.52	1.00	1	1.32
Wastage	5	6	3	1	3.75
Personal expense	0.75	0.50	0.3	2	0.89
Rent	1.30	0.50	1	2	1.20
Tax	1.6	1	1	1.00	1.15
Security	0.75	0	0	0	0.18
Electricity	1.75	0	0	0.35	0.53
Mobile bill	2	3	1	1.00	1.75
Others	1	1.6	1	0.40	1
Total	20.15	18.62	13.02	10.68	16.62

Source: Field survey, 2013.

**10. RECOMMENDATIONS**

The institutional recommendations are put forward with a view to improving the banana production as well as the existing marketing system of banana in the study areas. In the light of analysis of the study and observation, it was found that the banana is a prospective fruit but some special initiative is needed to improve its production and marketing potential. Measure should be taken to improve the knowledge of a farmer to the modern cultivation technique and encouraged them to adopt new technology to increase the production. Government should provide fertilizer and pesticide at low price as if, every farmer can get it easily. Government should subsidy to farmer during the natural calamity. The existing marketing is a problem, it is needed to reduce the marketing channel and marketing margin of the intermediaries by developing a well communicated co-operative marketing system. Government should take different steps to control the price system and ensure the price spread at a reasonable level to establish an efficient marketing system. For developing a more dynamic marketing channel in favor of the producer and intermediaries, another study program could be taken to generate information and suggestions.

**11. CONCLUSION**

Despite of some limitations, the findings of the study confirm that the farmers can obtain positive net return from cultivation of banana. In the context of income generation and poverty alleviation, production of crop like banana may play a crucial role in meeting the cash needs of the farmers. The findings of the study also revealed that the trading of banana is a profitable venture to different intermediaries. The profit of the retailer was higher than that of other intermediaries and the profit was found reasonable. But the marketing efficiency was not good in the study area. The gap between the producer's price and consumer's price was huge and the producers do not get their reasonable price for their product. On the other hand the intermediaries especially the retailer's net marketing margin is high enough and ultimately the consumers are the main sufferer of this marketing system. For this reason, the government should take an effective step to control the price system and price spread of the market and make sure that the producers can get their reasonable price and also the consumer can also get the product in a reasonable price. Banana is not only important source of nutrition but also an important source of cash income to growers and traders. Moreover, a large number of people were involved in the production and marketing of banana. So the farmers and intermediaries could be more benefited financially if production and marketing of banana are to be well expanded.

**12. SCOPE FOR FURTHER RESEARCH**

On the basis of the scope and limitations of the study and observations made by the researchers, the following areas were identified for further research:

1. This study was conducted in selected upazillas of three districts of Bangladesh, namely, Narsingdi and Gazipur. It is recommended that such studies should also be conducted in other areas of Bangladesh.
2. There are many subject-matter areas on the effects of excess use of chemical inputs in banana cultivation and marketing. Further research is needed in connection with other aspects related to society and environment.
3. There were many fruits, but only selected banana were considered for this study. Further research is needed to determine the effect of excess use of chemical inputs in other fruit cultivation and marketing.

**13. ACKNOWLEDGMENTS**

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