Economic Appraisal of Banana Production in Kushtia District: A Field-Based Study

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Abstract

Banana is one of the major fruit crops in Bangladesh. The cultivation of bananas has changed the fate of many farmers in six Upazilas of Kushtia district. This study aims to estimate the cost and returns of banana cultivation of banana cultivating farmers in Sadar Upazila of Kushtia district in Bangladesh. This study also analyses the socio-economic characteristics of banana cultivating farmers, and this study detects the problems of banana cultivation. Primary data were collected from 90 banana cultivating farmers from Kushtia Sadar Upazila using purposive sampling. Both descriptive and econometric techniques have been utilised to analyse the collected data. The findings show that a large part (51%) of banana growers are 41 years and above. Thirty-five per cent of banana farmers have no schooling. Fifty percent of banana farmers solely depend on agriculture. Most farmers (46%) have small families, i.e., four or below members exist per family. Above 44 percent banana cultivating farmers' monthly income is between the range of BDT 10,000-15,000. One of the third farmers cultivates their land. Major parts (33%) of farmers have experienced more than twenty years. It indicates a good sign for banana cultivation. The Benefit-Cost Ratio(BCR) on a full-cost basis is 3.24, and the return over cost is more than double, indicating that banana cultivation is a highly profitable business. The co-efficient of human labour, land preparation, irrigation, and fertiliser costs are significant at a 5% level. Despite the positive effect of sucker cost, pesticide cost, banana farming experience, and years of schooling on banana production, these are

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*not statistically significant. Major problems of the banana cultivators are the
higher price of fertiliser, disease and insect's infestation, low market price,
financial problems, inadequate extension service. The crucial favourable
factors affecting banana production in the study area are easy to access to the
market, efficient transport facilities, and favourable weather. Lastly, there
have been suggested some recommendations to uplift banana cultivation.*

JEL Classification *Q12 · C81 · D18 · D24 · O13 · O22*

Keywords *Production of Banana · Banana Cultivation · Benefit-cost
Ratio· Bangladesh*

1.   Introduction

Bangladesh, a country of South Asia, stands on the delta of the Padma and Jamuna
rivers in the north-western region of the Indian subcontinent. Bangladesh is a
densely populated country globally, and the density of population is 1115.62
people per square kilometre. The estimated population is 163.05 million in 2019,
making Bangladesh the 8th populous country globally. Bangladesh, currently, is
the 92nd largest country in the world, spanning 147570 km2 in terms of surface
area. Kushtia district is the 43r dmost prominent district of Bangladesh by area
and thirty fourth-largest by population (BBS, 2015). Kushtia is predominantly an
agricultural district. Various crops and fruits are grown in this district. The
principal crops and fruits are paddy, wheat, mustard, potato, betel leaf, tobacco,
mango, jackfruit, banana, litchi, guava. An eco-friendly agriculture system is
essential for long-term food security and sustainable development in Bangladesh.
For that reason, the present government has given the highest priority tothe
overall development of the agriculture sector in the Seventh Five Year Plan and
National Agriculture Policy.

Over the last few years, there has been an increasing trend in food production.
Despite this increasing trend,Bangladesh stands on the 83rd position in the
recently published Global Food Security Index-2019, the lowest among the
South-Asian countries. Though Bangladesh has gained recognition as a lower-
middle-income country in 2015, it secured the 83rd position in the case of food
security. So, the government should consider the formation of a right to food law
on a priority basis. Despite the increase in the income of people, the food quality
is not good. A major part of citizensis still severely food insecure and
malnourished. Based on the current population growth rate, a projected
population will be over 200 million by 2050. This demographic pressure
immensely affects food security. Roughly half of Bangladeshis are unable to
access sufficient food to meet their needs(USAID, 2019)

Last year, World Food Day was observed in Bangladesh, emphasising food security for the people by increasing the production of healthy diets. The day was observed under the theme "Our Actions Are Our Future". Poor diets are now being a leading cause of illness, linked to one-fifth of all deaths worldwide. In this regard, all-out effort should be taken to tackle this food insecurity. Overall, consensus exists among policymakers and academicians that crop diversifications are necessary to fulfil this gap. Banana is one of the critical tropical agricultural products that can make up the nutritional deficit in our country, which is grown all over the year throughout the country.

Moreover, which is cheap and covers significant nutritional value. Bananas represent 20% of all fruits crops produced in Bangladesh, with a domestic market share of 36%. Banana production provides suitable options for subsistence and income generation in Bangladesh. It is a commercial fruit, but in Bangladesh, it is grown in a limited area commercially. There are plenty of opportunities to cultivate bananas in the Kushtia district due to its geographical location and favourable weather. The country's total banana production, Kushtia, contributes 5% only (Agriculture Year Book, 2017-2018). The following table and graph show the scenario of banana production in Kushtia.

Table 1: Banana Production in Kushtia District

2014-15		2015-16		2016-17		2017-18	
Area (acres)	Production (M. Ton)	Area (acres)	Production (M. Ton)	Area (acres)	Production (M. Ton)	Area (acres)	Production (M. Ton)
3980	41193	3835	38592	3878	38988	3928	39914

Source: Agriculture Year Book, 2017-2018

Figure 1: Production of Banana

| 2014-15 | 2015-16 | 2016-17 | 2017-18 |
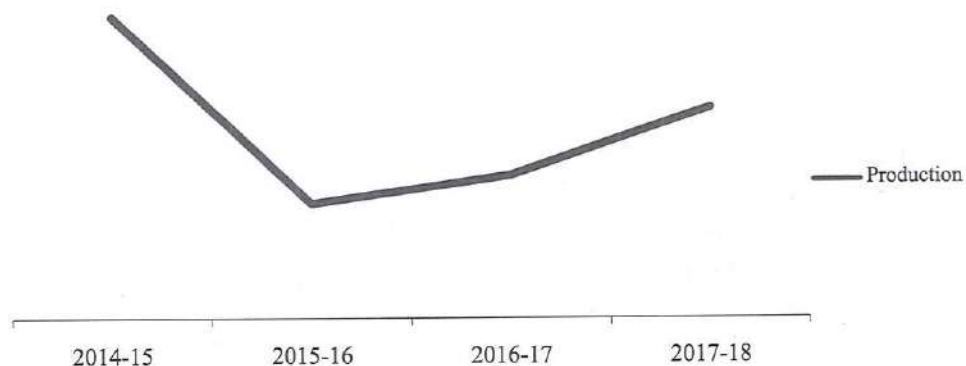
Under the above circumstances, the following questions try to be answered in this study.

- What is the socio-economic status of banana cultivating farmers in Kushtia?
- Is this cultivation beneficial or feasible through analysing the costs and benefits?
- What could be the appropriate recommendation for the improvement of banana cultivation?

This study is divided into six parts. The following section provides the objectives of this study. It is followed by a brief outline of the literature review-section four presents methodology. Then section five exhibits findings and discussion. The final section deals conclusion and recommendation.

2.   Objectives

The main objective is to study the economic profitability of banana cultivation in the Kushtia district. The specific objectives are

- To assess the socio-economic status of banana growing farmers in the study area
- To study the cost and returns of bananas in the study area
- To explore the problems of banana cultivation and offer a development strategy for producing bananas.

3.   Literature Review

In this section, a few works of literature were reviewed related to banana cultivation in Bangladesh. Notable analysis of Prodhan et al. (2017), Mukul and Rahman (2013), Kamal et al. (2014), Kamal (1996), Roy (1996), Nargis (1997) have been reviewed here. While reviewing the literature, it is noticed that district-wise analysis is very limited in Bangladesh though many works have been done around the world.

Mukul and Rahman(2013) conducted a study in the Narsingdi district from January to March 2013 based on primary data collected from 20 farmers, ten wholesalers, and ten retailers to assess banana production's relative profitability benefitting cost ratio for producers, wholesalers and retailers, respectively. They found that profits for the producer, wholesaler and retailer in banana production were Taka 55002.8 per Hectare, Taka 59.08 per Chari, and Taka 122.67 per Chari, benefit-cost ratio for producers, wholesalers, and retailers were 1.40, 1.30 and

1.41 respectively. One thing is that the sample size which is small to decide any general conclusion. Moreover, this study considers only the profitability of banana production. From a different angle, Prodhan et al. (2017) performed a study on knowledge, adoption, and attitude on banana cultivation technology of the banana growers of Bangladesh from a random sample of 100 banana growers of Salmara village Gaibandha district. They explored that most banana growers had a medium knowledge, adoption, and attitude towards banana cultivation technology. The 62% of banana growers belong to a medium level of adoption of banana cultivation technology, whereas 21 % of banana growers had a high level of adoption, and 17% of them had a low level of adoption. The economic appraisal was absent in this study. Kamal et al. (2014) aimed to determine the socio-economic status of banana growers in Bangladesh. They collected information from 60 loanee farmers were selected from four villages of Shibganj Upazila in Bogra district. They found that the average family sizes were 6.78, 4.71, 6.67 and 5.80 for small, medium, large and all farms, respectively. About 50.93 % of farm owners belong to the age group of 31 to 40 years. Only 12.67 % of banana growers were illiterate. About 62 % of farm owners dealt with agriculture as their primary occupation. The overall average farm size was 237.29 decimal. However, the farm sizes were 83, 224 and 405 decimals for small, medium and large farms. Family income derived from non-farm sources was more significant than that from farm income. The overall annual income was Taka 55414.7, in which banana farming contributed 35.32 %. They identified several problems in their study. Among them, problems of credit, non-availability or insufficiency of credit, high-interest rate and loan transaction cost, low prices of output, high prices of inputs, lack of sucker/seed of banana, high prices of fertiliser and insecticides, lack of storage facilities are a significant problem faced by the farmers in the study areas. The short come is the tiny sample size for their study. Kamal (1996) surveyed some selected areas of Joypurhat and found that banana production was more profitable than sugarcane. He explored that per hectare net income of bananas was Taka 67650.10, whereas sugarcane Taka 10980.66. Roy (1996) studied comparative economic analysis of banana and other crops production in Mymensingh district. His work considered the cost and return and the relative profitability of banana growers for comparison in that district. He detected that per hectare gross expense of banana production with intercrops was Taka 65583.13, while per hectare total return was Taka 111191297.24. The net return was Taka 12514.11. It can be seen that Roy(1996) also did not analyse the socio-economic characteristics of banana growers in that region. Nargis (1997) carried a comparative study on banana cultivation with other vegetables in some

selected areas of Muktagacha Thana. The study's major findings were that per hectare production cost of banana Taka 121438 and other vegetables Taka 92011, respectively. This study was done on the economic aspects of banana cultivation.

Most of the works have been done on banana cultivation, only considering the cost and returns of banana production. Moreover, limited studies have been performed to analyse the socio-economic characteristics of banana growers. However, no study has been carried out to assess the economic profitability of banana cultivation and the socio-economic characteristics of banana cultivating farmers in the Kushtia district. For that reason, a field-based study is needed to assess the cost and returns of banana cultivation andthe socio-economic conditions of banana cultivating farmers in the Kushtia district.

4.   Methodology

4.1   Sampling and Data Collection
A sum of 90 banana cultivating farmers has been selected purposively from the Abdulpur, Harinarayanpur and Jhaudia Unions under Sadar Upazila of Kushtia district. The following table shows the sampling unions and the selected sample number in each union. Questions were both open-ended and close. Data were collected from the study area from June 2019 to August 2019.

Table 2: Sample Size and Distribution

Name of District	Name of Upazila	Name of Union	Number of Samples
Kushtia	Sadar	Abdulpur	30
		Harinarayanpur	30
		Jhaudia	30
Total	1	3	90

Source: Author's Compilation, 2019

4.2   Calculation of Cost and Return
In order to calculate the net return of banana production,the gross value of the production of bananas and total costs were taken into account. The input variable costs such as labour, sucker, fertiliser, irrigation, and pesticide are the considerable main costs required for calculating banana production.

a)   Net Return
     Net profit = TR-TC
     Where,

TR= Total Revenue

TC=Total Cost.

b) Benefit-cost ratio (BCR):

The Benefit-Cost Ratio (BCR) of bananas has been used to identify whether banana cultivation is profitable or not. Here,

BCR =Gross Return /Total Cost.

4.3 Functional analysis

Cobb Douglas Production Function has been utilised to estimate the effects of variables on the production of bananas. The following specification of the model has been applied.

$$Y_i = \beta_0 \ X_1^{\beta_1} X_2^{\beta_2} X_3^{\beta_3} X_4^{\beta_4} X_5^{\beta_6} X_6^{\beta_6} X_7^{\beta_7} X_8^{\beta_8} e^{u_i}$$

In linear form

$$Y_i = \beta_0 + \beta_1 \hbar \ X_1 + \beta_2 \hbar \ X_2 + \beta_3 \hbar \ X_3$$
$$+ \beta_4 \hbar \ X_4 + \beta_5 \hbar \ X_5 + \beta_6 \hbar \ X_6 + \beta_7 \hbar \ X_7 + \beta_8 \hbar \ X_8 + u_i$$

Where Y is the dependent variable, β_0 is the intercept, $X_i=X_1$ to X_8 are independent variables, $\beta_i = \beta_1$ to $\beta_{(8)}$ are coefficients, and ui is the disturbance term in the production function and ln=natural logarithm.

5. Findings and Discussion

a. Distribution of Banana Cultivating Farmers by Age

According to the agricultural census of Bangladesh, a farm household is classified into three categories such as small (up to 2.4 acres), medium (2.5 to 7.4 acres), and large (7.5 acres or more) (BBS 2011). In the field survey, no banana farmer has been recognised as a large farm in the study area. Following Kamal et al. (2016), three age groups have been categorised for explaining the distribution of

Table 3: Age Distribution of Banana Cultivating Farmers

Age of Group	Small		Medium		Large		All	
(Years)	No.	%	No.	%	No.	%	No.	%
20-30	12	14.5	2	28.6	-	-	14	14
31-40	23	27.7	2	28.6	-	-	25	25
41 to above	48	57.8	3	42.8	-	-	51	51
Total	83	100	7	100			90	100

Source: Author's Compilation Based on Field Survey, 2019

banana cultivating farmers for this study. The age distribution of banana cultivating farmers is presented in table 3. The table shows that the highest number of banana growers (57.8 %) belonged to the age group 41 and above years for small farm while medium farm represents 42.8. It also reveals that the lowest number of banana growers belonged to 20-30 years (14 %) while the highest proportion represents 31-40 years (51%).

b.   Education Level of the Banana Cultivating Farmers

To present the educational status of banana cultivating farmers, years of schooling has been utilised, i.e., (i) 0 year, (ii) 1 to 5, (iii) 6 to 10 and (iv) 11 and above.The following table 4 exhibits the educational status of the banana cultivating farmers. The table shows that most banana growers had never gone to school, which indicates they are illiterate. Moreover, the illiterate groups' percentage was 36 and 29 for the small and medium farms, respectively. Fifteen percent of small farm holders were 1 to 5 years of schooling, and no medium farms owner are in this category. The overall picture of educational status is that 34.4 % of banana growers were illiterate and 13.3 % had 1 to 5 years of schooling, 32.2 % had 6 to 10 and 20 % of 11 and above.

Table 4:Education Status of the Banana Cultivating Farmers

Years of Schooling	Small		Medium		Large		All	
	No.	%	No.	%	No.	%	No.	%
0	29	36	2	29	-	-	31	34.4
1 to 5	12	15	0	0	-	-	12	13.3
6 to 10	26	29	3	42	-	-	29	32.2
11 and above	16	20	2	29	-	-	18	20.0
Total	83	100	07	100			90	100

Source: Author's Compilation Based on Field Survey, 2019

c.   Occupation of the Banana Growers

Large parts of banana cultivators are occupied in agriculture. Forty-eight percent of small farm owners are engaged in agriculture, while in the case of medium farm owners, it is 72%. Only four percent of small farm owners are involved in service besides agriculture and there is no participation in service for medium farm owners. It can be seen that 46%, 14% of small and medium farm owners have been continuing business with agriculture. A tiny part of small and medium farm owners, i.e., 2% and 14%, run agriculture with other occupations. Since

there have not been found large farm owner farmers, that group's percentage is empty here.

Table 5:Occupational Status of Banana Growers

Particulars	Small		Medium		Large		All	
	No.	%	No.	%	No.	%	No.	%
Agriculture	40	48	5	72	-	-	45	50
Agriculture cum Service	3	4	0	0	-	-	3	3
Agriculture cum Business	38	46	1	14	-	-	39	43
Agriculture cum others	2	2	1	14	-	-	3	3
Total	83	100	07	100			90	100

Source: Author's Compilation Based on Field Survey, 2019.

d.   Family Type

In this study, family types are categorised based on family members who live in the same household and take a meal from the same kitchen under the administration of the same head of the family. Family is classified into three categories like small, medium and large in the study. The following table 6 shows that 46 percent of farmers have small families, 26 percent of farmers have medium family and 28 percent of farmers have large family respectively. It shows that most of the people belong to small size family.

Table 6:Family Type of the Banana Cultivating Farmers

Particulars	Small		Medium		Large		All	
	No.	%	No.	%	No.	%	No.	%
Small family ≤4	40	48	1	14	-	-	41	46
Medium Family =5	21	25	2	29	-	-	23	26
Large Family ≥6	22	27	4	57	-	-	26	28
Total	83	100	07				90	100

Source: Author's Compilation Based on Field Survey, 2019

5.5   Monthly Family Income

The average monthly income of the banana cultivating farmers has been considered from the earnings of banana cultivation and various income-generating activities during the study period. Selected farmers are grouped into five categories according to the level of total monthly income. The following table shows that 44.4 percent of farmers have the income level of Taka 10001-15000 and it is the highest percentage of farmers. Then 23.4 percent 15.5 percent farmers

have the income level of Taka 15001-25000 and Taka 35001-45000 respectively. Only 5.6 percent have Taka 45001 and above earnings. The major part of monthly income is between the first categories due to the large portion of the sample consisting of small farm owners.

Table 7:Monthly Income of the Banana Cultivating Farmers

Farm Type	Monthly Income (in Thousand Taka)					
	10001-15000	15001-25000	25001-35000	35001-45000	45001 and above	Total
Small	40	19	13	8	3	83
Medium	0	2	1	2	2	7
Large	-	-	-	-	-	-
%	44.4	23.4	15.5	11.1	5.6	100
Total						90

Source: Author's Compilation Based on Field Survey, 2019

5.6　Ownership Pattern of Land

Three different categories have been classified for land ownership, i.e., own land rented and leased. Other lands like pond and homestead areas have not been accounted for land ownership except for agricultural land. Tables 8 shows the ownership pattern of land. Most farmers, 74 percent of farmers, have their own land. Eight percent of farmers have cultivated rented land, and 18 percent of land are leased from others.

Table 8:Ownership Pattern of the Banana Growing Farmers

Land Type	Small		Medium		Large		All	
	No.	%	No.	%	No.	%	No.	%
Own	62	75	5	71	-	-	67	74
Rented	7	8	0	0	-	-	7	8
Leased	14	17	2	29	-	-	16	18
Total	83	100	07	100			90	100

Source: Author's Compilation Based on Field Survey, 2019

5 .7　Banana Farming Experience of the Farmers

Farming experience is considered a critical factor in agriculture. The farming experience is expressed in the following table. It shows that 33 percent of farmers have experience 20 to 24 years. Furthermore, 19 percent of farmers have experienced between the ranges 15-19. The same percentage of farmers have

experienced between 25 years and above. It can be seen that most of the farmers have enough experience in cultivating bananas.

Table 9:Banana Farming Experience of the Farmers

Experience Range (Years)	Frequency	Percentage
5-9	14	16
10-14	12	13
15-19	17	19
20-24	30	33
25 and above	17	19
Total	90	100

Source: Author's Compilation Based on Field Survey, 2019

5.10 Cost and Return from Banana Cultivation

All variable costs incurred for hired labour, land preparation, cost of sucker, fertilisers, pesticides, and irrigation are considered for calculating the cost of banana cultivation. Family labour was not included here due to data unavailability. While collecting data, it was seen that sucker cost was meagre because maximum banana cultivating farmers extracted sucker from their own land.

Table 10: Cost and Return from Banana Cultivation in the Study Area

Items	Total Amount (BDT) per Bigha
Cost	Amount (BDT)
Labor	5,410
Land Preparation	1,806
Sucker/Seedling cost	143
Irrigation	1,633
Pesticide	403
Fertilizer	5,510
Total Cost	14,905
Total Revenue	63,480
Net Profit	48,375
Benefit Cost Ratio	3.24

Source: Author's Compilation Based on Field Survey, 2019

Net Profit: Net profit is calculated by subtraction from total revenue to the total cost. Total revenue is Taka 63,480 and total cost is Taka 14,905 per Bigha. So the net profit is Taka 48,375.

Benefit-Cost Ratio:Benefit-cost ratio is calculated from the above table by dividing total revenue and total cost on the full cost basis. Total revenue is Taka 63,480 and total cost is Taka 14,905 per Bigha. So the Benefit-Cost Ratio (BCR) on the full cost basis is 3.24.

5.11 Result from Estimation of Cobb-Douglas Production Function

The relationship between input and output of banana cultivation is estimated using the Cobb-Douglas production function. Several explanatory variables are taken into consideration to analyse the productivity of bananas. The effects of the variables on the yield of the banana cultivation are interpreted in table 11.

Table 11:Estimation of Production Function

Explanatory Variables	Coefficients	Std. Err.	p-value
Human Labor (X_1)	-3.50	1.158	0.003
Land Preparation Cost(X_2)	11.76	2.772	0.000
Sucker/Seedling Cost(X_3)	9.12	8.815	0.303
Irrigation Cost(X_4)	13.84	3.456	0.000
Pesticide Cost(X_5)	11.11	8.449	0.192
Fertilizer Cost(X_6)	3.34	0.782	0.000
Banana Farming Experience(X_7)	303.82	793.595	0.702
Years of Schooling(X_8)	2130.89	1294.111	0.103
Constant	-15760.96	20921.78	0.453
F-Value	28.74		0.000
R-squared	0.74		

Dependent variable: Total Revenue, Number of Observation=90

The estimation results show that the co-efficient of human labour, land preparation, irrigation, and fertiliser costs are significant at a 5% level. The coefficient of multiple determinations R-squared is 0.74,which means the explanatory variables considered in the model can explain 74 percent of the variation in banana production. It implies that the variation in banana production mostly depends upon the explanatory variables included in the model. Despite sucker cost, pesticide cost, banana farming experience, and years of schooling positively impacting banana production, their influences are not statistically significant.

The estimated human labour co-efficient is -3.5, indicatinga 1% increase in human labour with the other factor remaining constant would decrease the total revenue by 3.5%. The value of production co-efficient for land preparation cost is 11.76. It reveals that with other factors remaining constant, it would increase the total revenue by 11.76. The value of production co-efficient for irrigation cost is

13.84. The estimated co-efficient reveals that a 1% increase in irrigation cost in the pre-harvesting period with other factors remaining constant would increase the gross return by 13.84 percent. The co-efficient of fertiliser cost is 3.34. It means that a 1% increase in fertiliser cost in the pre-harvesting period with other factors remaining constant would increase the gross return by 3.

5.12 Problems of the Banana Growers

Banana cultivating farmers confront several problems throughout the year in the study area. In this part, a modest attempt has been drawn to identify the most crucial problems of banana cultivating from the opinion of banana growers. Ninety-five percent of farmers responded about the higher price of fertiliser. It was reported that bananas were seriously affected by disease and insect's infestation. Ninety-four percent of farmers reported that they had been suffered from disease and infestation.

Secondly, 42 percent farmers claimed that they do not get competitive market price for banana. The same percentage farmer replied they faced financial problem to cultivate banana. They don't receive any financial facility from government. 40 percent farmers informed that lack of technical knowledge, i.e., inadequate extension service, which hampered their production. Additionally, the high price of insecticides and fertiliser creates a burden to overcome this problem.Along with these lack of quality sucker, credit problem and lack of efficient transport facilities are also important causes of banana cultivation.

Table 12: Problems Faced in the Banana Cultivation

Problems	Frequency	Percentage
Lack of Quality Seed/Sucker	14	16
Credit Problem	15	17
Financial Problem	38	42
Lack of Technical Knowledge	36	40
Low Market Price	38	42
Lack of Efficient Transport Facilities	13	14
Disease and Insects Infestation	85	94
High Price of Fertilizer	86	95

Source: Author's Compilation Based on Field Survey, 2019

5.13 Advantageous Factors of Banana Cultivation

The positive factors for banana cultivation are considered the factors that are beneficial for farmers to cultivate bananas. Usually,a friendly environment, high

profit, availability of input are factors that facilitate cultivating bananas. The following table depicts the perception of banana growing farmers about advantageous factors.

The above table reveals that the most advantageous factors are easy to access to market, efficient transport facilities, low input cost, and favourable weather respectively in terms of percentage. The least advantageous factors are easy to access to technical support, available training and adequate support from NGOs.

able 13:Advantageous Factors of Banana Cultivation in the Study Area

Advantageous Factors	Percentage of Responses
Easy Access to Market	93
Easy Access to Technical Support	17
Favourable Weather	68
Low Input Cost	72
Access to Credit	28
Available Training	.03
Adequate Support from NGOs	.07
Efficient Transport Facilities	88

Source: Author's Compilation Based on Field Survey, 2019

6.   Conclusion and Recommendations

In this study, an attempt was made to assess the cost and returns of banana cultivation, the socio-economic condition of banana cultivating farmers, and explore problems associated with banana production in Sadar Upazila of Kushtia district in Bangladesh. Primary data were collected from 90 banana cultivating farmers from Kushtia Sadar Upazila. Both tabular and econometric techniques were used to analyse the collected data. The study findings reveal that the highest proportion (51%) of banana growers age 41 years and above. Almost 35% of banana farmers have no formal education. One of the main reasons is that most banana growers in this study are small size farm owners. Fifty percent of banana farmers solely depend on agriculture, and then 43 percent of farmers' occupation carrying agriculture with business. The family structure of most farmers (46%) have a small family, i.e., four or below members per family. Most of the banana cultivating farmers' monthly income is between the ranges of Taka 10000-15000. Seventy-four percent of farmers cultivate their own land in the study area. A major part (33%) of farmers have experienced more than twenty years. Itis indicative of a good sign for banana cultivation. The Benefit-Cost Ratio(BCR) on a full cost basis is 3.24, and the return over cost is more than double, indicating that banana cultivation is a highly profitable business. The co-efficient of human labour, land preparation, irrigation, and fertiliser costs are significant at a 5% level.

On the other hand, despite the positive effect of sucker cost, pesticide cost, banana farming experience, and years of schooling on banana production, these are not statistically significant. Major problems of the banana cultivators are the higher price of fertiliser, disease and insect's infestation, low market price, financial problems, inadequate extension service. The crucial favourable factors affecting banana production in the study area are market access, efficient transport facilities, and favourable weather.

Based on the findings of the study, the following recommendations may be forwarded for the development of banana cultivations:

1. To increase banana production sufficient supply of fertiliser ata fair price should be ensured.
2. Pure pesticide and pest management knowledge should be available to banana growers. Moreover, cheap and effective pesticides should be provided.
3. Smallholders dominate the country's farm sector, but the small and marginal farmers have the least access to the state's credit and agricultural extension services. Credit facilities should be updated. Government should take necessary steps in this respect.
4. Fair market prices should be ensured to encourage banana production. The role of intermediaries and local agents should be controlled strictly.
5. Effective agriculture extension services are needed to fulfil the gap of technical knowledge of banana growers.
6. Educational status needs to be improved so that banana farmers can be conscious of using modern techniques correctly.
7. Above all, the traditional value chain of banana production should be developed to get quality and safe bananas that can bring more revenue.
8. Further research can be directed on the development of the value chain of banana cultivation.

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