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ORIGINAL ARTICLE

An economic study of banana production by BKB borrowers in a selected area of Sylhet district of Bangladesh

Anusree Samadder[1], Mohammad Ataur Rahman[2] and Jiban Krishna Saha[1]

[1]Department of Agricultural Finance and Banking, Sylhet Agricultural University, Sylhet
[2]Department of Agricultural Finance, Bangladesh Agricultural University, Mymensingh

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ABSTRACT

Banana farming is a capital-intensive agribusiness initiative in Bangladesh. Success of banana cultivation largely depends on precise use of inputs in exact times and adequate quantity. So, sufficient and uninterrupted credit support is essential for this type of investment. The present study examined the adequacy, utilization and repayment of credit, the profitability and major problems of banana cultivation in Fenchuganj upazila of Sylhet district in Bangladesh. Primary data were collected from 60 borrowers of Bangladesh Krishi Bank (BKB) who were engaged in banana cultivation. Both tabular and econometric techniques were used to analyze the collected data. The findings of this study revealed that the adequacy of the loan was satisfactory. Borrowers were found to be acquainted about purposive utilization of loaned money. Most of the credit amount (92.64%) was utilized for farming purposes. Status shows that repayment was fully satisfactory (100%). Multiple regression model indicates that amount of loan received, savings, age, and return from production were significantly affecting loan repayment. The total cost of production of banana was estimated Tk. 240371 per acre, while gross and net returns were Tk. 331221 and 90850, respectively. The BCR was 1.38 indicating that 1 Tk. investment resulted in a net benefit of Tk. 0.38. Finally, the study identified some major problems of banana cultivation like lack of human labor, low output price, high prices of inputs, lack of quality sucker, and lack of storage facilities etc. As lack of human labor is the most chronic problem faced by the banana growers, capital intensive modern technology should be employed in banana cultivation and for that institutional credit facilities should, therefore, be made available on easy terms and conditions to the banana growing farmers.

INTRODUCTION

The economy of Bangladesh is traditionally agricultural and most of the inhabitants are involved in agriculture directly or indirectly for their livelihoods. The country possesses very fertile land in which diversified crops grow very easily. Bangladesh ranks 14th among the top 20 banana producing countries in the world. It is a nutritious fruit crop in the world and grown in many tropical areas where they are used both as a staple food and dietary supplements (Assani et al. 2001). Banana is delicious fruit crop grows widely all over Bangladesh and most important fruit from the stand point of food value and availability throughout the year (USAID 1969). In Bangladesh, total production of banana was 774286 metric tons in an area of 119325 acres in which Sylhet alone accounted for 1882 metric tons in 1463 acres in 2012-13 (BBS 2013). The Banana is the most indispensable and significant fruit crop which shares about 18% of total fruits production with 10% share in the area (BBS 2013).

Land is gradually decreasing in Bangladesh and the number of landless people are increasing with the rapid growth rate of population. It is reported that 28.7% of households have only homestead but do not have cultivable land up to 0.20 ha (Fardaus 2012). For that reason, production strategies require being formulated in a manner so as to each family will be able to meet their own food production. Intensive banana cultivation in the homestead is a widely accepted concept for the development of landless people. Banana cultivation can play an important role in poverty alleviation and fight against malnutrition in the country. Some of the innovative farmers adopted commercial banana production as viable alternatives to traditional cash crop and field crop. Nevertheless, the rate of adoption and sustainability of banana depends on upon its

*Corresponding author: marahman@bau.edu.bd

economic profitability. Every year farmers have to manage their capital from internal as well as external sources for banana cultivation. Internal sources indicate their own saving if any, disinvestment of assets, etc. and external source means having a loan from the different banks, NGOs and non-institutional sources of credit. Since banana has considerable significance in the economy of Bangladesh, it is necessary to provide expanding credit facilities to the farmers. Credit support to banana producers certainly has a positive effect on the potentiality. So, a study dealing with the economics of banana farming bears immense importance in the present situation of Bangladesh and the researchers undertook the study with the following objectives:

i. To assess the availability of credit, its utilization and repayment by the banana growers under BKB credit program;

ii. To determine profitability of banana production in the study area; and

iii. To identify the problems faced by the beneficiaries and recommend measures for their improvement.

MATERIALS AND METHODS

Fenchuganj upazila of Sylhet district in Bangladesh was selected purposively as Sylhet is one of the major banana producing areas of Bangladesh. The study was conducted in 8 villages of the upazila namely Kayastha Gram, East Judhishtipur, West Judhishipur, Maiz Gaon, Nijgilachara, Ashigarh, Ujangangapur and Islampur. A total 60 banana growers taking loan from BKB were randomly selected for the study. The study was based on primary data collected through face to face interview by using semi-structured questionnaire. The period covered in this study was January to December/2015. Data were collected during the months of January to March, 2016. Data were presented mostly in tabular form. To assess the effects of key variables in repayment process, multiple linear regression model was specified as follows:

$Yi=a\ X1^{\beta1}\ X2^{\beta2}\ X3^{\beta3}\ X4^{\beta4}\ X5^{\beta5}\ X6^{\beta6}\ e^{ui}$

In linear form

$\ln Yi = \ln a+\beta1\ln X1+ \beta2\ln X2+ \beta3\ln X3+ \beta4\ln X4+ \beta5\ln X5+ \beta6\ln X6+ui$

Where,
Yi = amount of repayment (Tk)
X1 = received amount of loan (Tk)
X2 = respondent's income (Tk)
X3 = respondent's saving (Tk)
X4 = return from banana farming (Tk)
X5 = respondent's age (years)
X6 = education of the respondent (years of schooling)
β1, β2, β3, β4, β5, β6 = co-efficient of the respective variables
ui = Error term
a = intercept = constant
ln = natural logarithm

For profitability analysis, activity budgets (Dillon and Hardaker, 1993) of the banana cultivation were prepared using the following algebraic equation:

$$\pi = P_y Y - \sum_{i=1}^{n} (P_{xi} X) - TFC$$

π = net return (Tk/acre);
P_y= price of the product (Tk/kg);
Y= quantity of product (Kg/acre);
P_{xi}= price of i^{th} input (Tk/unit);
X_i = quantity of i^{th} input;
TFC= total fixed cost (Tk);
i= 1,2,3,……..,n (number of inputs).

Apart from the profitability analysis, undiscounted benefit-cost ratio (BCR) was calculated dividing per acre gross return by gross cost.

RESULTS AND DISCUSSION

Credit adequacy

Capital is required for investment in various income generating activities as well as to meet individual and family need. To fulfill capital requirement, credit is helpful as it creates scope for further investment. The demand for credit of a person depends to a great extent on his economic condition as well as on type and scale of activities in which he is engaged. Adequacy generally means the sufficiency of loan to meet the need of the borrowers. It is usually expressed in terms of percentage of requirement or amount applied for by the borrowers. It is very difficult to compare the adequacy of credit needs of different enterprises because of their different levels of practice. On the basis of the amount of loan taken by the respondents, they were classified into three categories as presented in Table 1. Table 1 reveals that 6.67% of the respondents received small amount of loan, while 25% and 68.33% received medium and large amounts, respectively It also apparent that respondents received the same amount they applied for. So, adequacy of credit for the borrowers was fully satisfactory.

Credit utilization

Credit plays an important if it is properly utilized. Proper use increased production and benefits the borrowers. On the other hand, if it is used for unreported purposes it will result in loan default and weakens the financial viability of the concerned lending institution. Proper utilization is a pre-requisite to attain the aim and target of both loan receivers and lending institutions as well as for the economic development of the country at large. It is evident from Table 2 that utilization of credit money for expenditure on farming was higher than expenditures on other categories. Moreover, it was negatively related with loan category as small loan receivers made the highest utilization (100%) while large did the same by the lowest (43.44%). There was no use of credit for family expenditures. So, utilization pattern of credit by the banana farmers in the study area was more or less satisfactory comparing other agricultural credit utilization scenarios of Bangladesh.

Credit repayment

Repayment capacity is one of the crucial aspects of credit analysis and a successful credit program always attributes by its satisfactory repayment. BKB charges 10% interest for its credit on banana farming. In the study area, most of the beneficiaries repaid their loan on monthly basis along with interest. Table 3 clearly depicts that all the respondents under study repaid all their loan money within time with interest. So, repayment performance was fully satisfactory. Total repayment appeared to be Tk. 2717000 in which principal amount was Tk. 247000 and the rest of Tk. 247000 was the interest. Moreover, the finding differs from the general notion that BKB borrowers' repayment performance is poor.

Factors affecting loan repayment

Results of multiple linear regression analysis furnished in Table 4 shows that only loan amount, return from banana, savings and education of the respondents had positively significant coefficients. It means keeping other things constant, repayment would be enhanced by 0.089%, 0.265%, 0.166% and 0.150% if

loan amount, savings, return from business and education of the respondents would be increased by 1%, respectively. It has been seen that large amount of loan has a great impact on repayment as absence of timely repayment would make the interest more. So, these farmers try to avoid large amount of repayment by repaying in time. The farmers who get higher return and saving, likely to be repaid their loan. Educated farmers are more conscious about their loan repayment and repay as soon as possible. The coefficient of multiple determinations (R^2) was 0.72. It indicates that about 72% of variations in loan repayment have been explained by explanatory variables included in the model. The value of adjusted R^2 was 0.672 indicates after taking into account the degree of freedom, about 67% of the variation in the dependent variable was explained by the explanatory variables. So fitness of the model was more or less satisfactory. Besides, F-value was 15.37 and it was significant at 1% level implying that all the explanatory variables included in the model are important for explaining the variation of the dependent variable in banana loan repayment. So, it can be said that received amount of loan, savings, return from business and education of the respondents were the most important factors affecting timely repayment of banana credit extended by BKB in the study area.

Table 1. Adequacy of credit to the BKB borrowers

Category	Loanee farmers		Average amount applied for (Tk.)	Average amount received	
	No.	%		Tk.	% of amount applied for
Small (<Tk. 15,000)	4	6.67	10500	10500	100
Medium (Tk.15,000- 30,000)	15	25	24000	24000	100
Large amount (>Tk. 30,000)	41	68.33	50439	50439	100
All	60	100	41166.65	41166.65	100

Source: Field Survey 2016

Table 2. Utilization of credit by the respondents

Heads of utilization	Category					
	Small (<Tk. 15,000)		Medium (Tk. 15,000- 30,000)		Large (>Tk. 30,000)	
	Tk.	%	Tk.	%	Tk.	%
Expenditure on farming	10500	100	23052	96.05	42086	43.44
Expenditure on business and tailoring	-	-		-	6315	12.52
Expenditure on transportation and equipment	-	-	364	1.52	560	1.11
Others	-	-	584	2.44	1478	2.93
Total	10500	100	24000	100	50439	100

Source: Field Survey 2016

Profitability of Banana cultivation

In the study area farmers used both purchased and home supplied inputs for cultivating banana. Both inputs were valued at prevailing market price during the study period. Usually, old banana cultivators use those suckers which are grown in their field. New farmer has to buy sucker from other banana farmer. Table 5 exhibits that sucker stood the largest variable cost item constituting 23.90% of total cost. It was followed by bamboo, human labor, fertilizer and manure having respective shares of 19.86%, 18.42%, 10.20% and 3.25%, respectively. In the case of fixed cost, land use cost (rental value of banana plot) was the highest (16.47%) and interest on operating capital constituted the lowest (3.98%). Considering all items together, average per acre cost of banana cultivation amounted to be Tk. 240371.70 in which total variable cost shared 79.49% and the rest of 20.51% was shared by total fixed cost.

Table 3. Repayment status of the respondents

Heads	Amount/percentage
Principal amount received (Tk.)	2470000
Interest after 1 year @ 10% (Tk.)	247000
Total amount to be repaid (Tk.)	2717000
Amount repaid (Tk.)	2717000
Amount unpaid (Tk.)	-
Repayment performance (%)	100

Source: Field Survey 2016

Gross return is the value of banana in money terms. This was estimated by multiplying the per acre total quantity of product by their respective prevailing market prices. The average market prices of Chini Champa and its sucker were Tk. 200 per bunch and 35 per piece while they were Tk. 220 and 40 for Shail, respectively. Total return from banana production was estimated at Tk. 331221.30 which was constituted 85.03% by bunches and 14.97% by suckers (Table 6).

Table 4. Estimated values and related statistics for overall repayment

Explanatory variables	Estimated values of coefficient (α i)	Standard error (Se)	t-values	p-values
Constant (α0)	12.937	1.27	10.190	0.095
Received amount of loan (X1)	0.089**	0.026	3.450	0.001
Respondents' income (X2)	0.019	0.107	0.180	0.7508
Savings (X3)	0.265*	0.113	2.357	0.021
Return from banana (X4)	0.166**	0.046	3.620	0.000
Age (X5)	0.004	0.006	0.811	0.184
Education of respondents (X6)	0.150*	0.047	3.183	0.0485
R^2	0.72	-	-	-
Adjusted R^2	0.672	-	-	-
F-value	15.37**	-	-	-

Source: Field Survey 2016

Note, ** = significant at 1% level of confidence, * = significant at 5% level of confidence

Producers generally want to gain maximum return over variable cost of production. So, gross margin was calculated by

deducting total variable cost from gross return. Gross margin of banana production was found to be Tk. 140009.20 (Table 7). Net return, difference between total return and total cost, was estimated at Tk. 90849.60 which was 37.80% of the total cost. Moreover, undiscounted BCR was appeared to be 1.38. So, it can be said that profitability of banana cultivation was satisfactory compared to other agricultural enterprises in the study area.

Table 5. Cost of banana production (per year per acre)

Cost items		Unit	Total quantity	Price/unit (Tk.)	Average cost	
					Tk.	%
A. Variable cost						
Sucker	Shail	No.	7650	40		
	Chini Champa	No.	2510	35	57833.79	23.90
Bamboo		No.	6219	100-110	47799.21	19.86
Manure		Kg	21710	5	7815.16	3.25
Fertilizer	Urea	Kg	8700	15	24525.10	10.20
	TSP	Kg	4534	21		
	MOP	Kg	6452	14		
	NPK	Kg	140	70		
Insecticide	Tilt	Liter	1.600	197 (100 mL^{-1})	3455.97	1.44
	Round Up	Liter	210	45 (mL^{-1})		
	Bavistin	Kg	2.400	250 (g^{-1})		
	DDT powder	Kg	30.375	400 (750 g^{-1})		
	Thiovit	Kg	49	165 (100 mL^{-1})		
Irrigation		Tk.	-	15	3209.65	1.33
Human labor		Man-day	173	250-300	44307.07	18.42
Animal and Machine powers		Pair- (Day / per hour)	36	100	2634.22	1.10
Total variable cost		Tk.	-	-	191212.11	79.49
Interest on operating capital		Tk.	-	-	9560.61	3.98
Land used cost		Tk.	-	-	39598.96	16.47
B. Fixed cost		Tk.	-	-	49159.57	20.51
Total cost (A+B)		Tk.	-	-	240371.70	100

Source: Field Survey 2016

Table 6. Return from banana production (per year per acre)

Items	Product	Unit	Quantity	Price/unit	Average gross return	
					Tk.	%
Banana Bunche	Shail	No.	14590	220	281635.10	85.03
	Chini Champa	No.	1969	200		
Sucker	Shail	No.	14683	40	49586.11	14.97
	Chini Champa	No.	2104	35		
Total		-	-	-	331221.30	100

Source: Field Survey 2016

Table 7. Per acre profitability of banana cultivation

Particulars		Value (Tk.)
Gross return (GR) (Tk.)		331221.3
Total variable cost (TVC) (Tk.)		191212.11
Total variable cost (TVC) (Tk)		49159.57
Total cost/Gross cost (TC=TVC+TFC) (Tk.)		240371.7
Gross margin (GM= GR-TVC) (Tk.)		140009.2
Net return (NR=GR-TC)	Tk.	90849.6
	%	37.80
BCR (GR/TC)		1.38

Source: Field Survey 2016

Problems associated with Banana cultivation

Respondents were asked to express about the problems they were encountering in their banana cultivation. Responses thus collected are summarized in Table 8. It was found that almost all the respondents encountered almost same nature problems but in varied degrees. It appears in Table 8 that lack of human labor was encountered as the most hindering problem for banana cultivation as it was mentioned by maximum (95%) of the borrowers. It was followed by lower output price, inadequate extension services and high price of fertilizer and pesticide (90%, 78.33% and 76.67%, respectively). Besides, banana producers were facing some other problems as exhibited in Table 8. So, although profitable, banana cultivation was constrained by several limitations in the study area.

Table 8. Problems faced by the respondents

Sl. No.	Problem	Respondents facing the problems		
		No.	%	Ranking
1	Lack of credit facilities	12	20.00	10
2	High interest rate of credit	23	38.33	7
3	Low price of output	54	90.00	2
4	High price of input	41	68.33	5
5	Lack of human labor	57	95.00	1
6	Lack of sucker	28	46.67	6
7	High price of fertilizer and insecticides	46	76.67	4
8	Lack of storage facilities	26	43.33	6
9	Lack of suitable market	15	25.00	9
10	Problem of theft	28	46.67	6
11	Diseases attack	17	28.33	8
12	Inadequate extension service	47	78.33	3
13	Complexity of loan procedure	12	20.00	10
14	High transaction cost	2	3.33	11

Source: Field Survey 2016

Possible solutions of the problems

Respondents were requested to express what they thought about solutions of the problems faced by them. It is evident from Table 9 that maximum of the producers (88.33%) suggested for improving the price of product produced by the farmers. Following it 81.67%, 71.67% and 63.33% suggested to reduce price of fertilizer and pesticide, enhancing extension services by government and non-government organizations and providing storage facilities for the bananas after harvest, respectively. The subsequent solutions as suggested by the respondents were dissemination of scientific and modern technologies, ensuring training on banana cultivation, ensuring supply quality sucker, etc. Banana farmers were found highly interested about their enterprise and eagerly mentioned the problems and solutions. So, it is expected that addressing all these issues effectively would certainly provide adequate incentives for banana cultivation as it is a profitable enterprise.

CONCLUSIONS

The present study indicates that banana cultivation was a profitable business. But it was a capital demanding agribusiness. Maximum loan was mainly utilized in reported purposes that means only in banana cultivation. Borrowers were found to be conscious about purposive utilization of loan money. So, repayment of credit was found to be extremely satisfactory by the borrowers. Borrower loans were mostly given in accordance with their demand and almost all of them were male. Respondents were also found to have credit from other non-institutional sources and used their own fund in farming. The savings position of borrowers was also satisfactory than others. But some problems were faced by the farmers specially lack of human labor and low price of output. Biological constraints such as insect-pest-diseases are cause serious damage and yield loss of banana in Bangladesh (Hosaain 2014). Beside those problems, banana farming could be more sustainable and attractive commercial enterprise which can improved their socioeconomic status as well as assist in alleviating rural poverty of Bangladesh.

Table 9. Possible Solutions to the problems of banana cultivation

Sl. No.	Suggestion	Respondents mentioning solution	
		No.	%
1	Increase extension services	43	71.67
2	Increase price of output	53	88.33
3	Increase availability of credit facilities	18	30.00
4	Training facilities on banana cultivation	31	51.67
5	Supply of environmental friendly insecticides	7	11.67
6	Prosper storage facility	38	63.33
7	Supply of quality sucker	26	43.33
8	Reduce cost of fertilizer and insecticide	49	81.67
9	Supply good quality fertilizer	17	28.63
10	Timely supply of credit	21	35.00
11	Dissemination of market information	15	25.00
12	Dissemination of scientific and modern technology	35	58.33
13	Reduce the cost of credit	2	3.33

Source: Field Survey 2016

CONFLICTS OF INTEREST

The author declares that there is no conflict of interests regarding the publication of this paper.

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