Farm Economy *ISSN: 2789-3502*
The Journal of the Bangladesh Agricultural Economists Association
June 2022, Volume XVII, Page: 147-159

PROFITABILITY AND RESOURCE USE EFFICIENCY OF ELEPHANT FOOT YAM PRODUCTION IN SELECTED AREAS OF SOUTH WESTERN BANGLADESH

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Abstract

The study was conducted in Jashore, Kushtia and Satkhira areas during 2017-18 to determine profitability and resource use efficiency of elephant foot yam as well as to identify the constraints to elephant foot yam production. A total of 150 samples taking 50 samples from each district were randomly selected for data collection. Tabular and statistical analyses were done. Findings revealed that majority farmers were used *Madrazi* variety of elephant foot yam and inputs use were differed from area to area. Cobb-Douglas production function model reveals that labour, ploughing, zinc and irrigation had positive effect on yield. The average yield of elephant foot yam was 26.87 t/ha. The average cost of production was estimated at Tk.444508/ha on the basis of full cost. The average gross return, gross margin and net return were found to be Tk.740486/ha, Tk.331269/ha and Tk.295978/ha, respectively. Benefit cost ratio (BCR) was found to be 1.64 on total cost basis. According to returns and BCR, elephant foot yam production was found to be profitable in the study areas. Farmers faced some constraints which hampered yield. The major constraints were lack of improved production technology and attack of viral and fungal diseases. So, research thrust should be given to develop improved variety and to control pest and diseases for higher production of this important medicinal and high value crop.

Keywords: Elephant foot yam, profitability, resource use efficiency, Bangladesh.

1. Introduction

Vegetable is important for nutrition, food security and economic development. Bangladesh is suffering from the problems of poverty, unemployment and malnutrition. Vegetable sub-sector can play an important role to solve these problems in the shortest possible time. The Elephant foot yam belongs to the family of "Araceae" and genus of "Amorphophallus". Many indigenous *Ayurvedic* and *Unani* medicinal preparations are made using its tubers. It is a good source of protein, carbohydrates and omega 3 fatty acids, antioxidants. It helps in reducing LDL (bad cholesterol), lowering blood sugar levels, preventing muscle spasms, reducing the risk of cancer, weight loss, women for estrogen and hormonal

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balance, lowering blood pressure, liver cleansing. It has low glycemic index, hence helps in diabatic patients. The tubers are believed to have blood purifying characteristics and are used in medicines for the treatment of piles, asthma, dysentery and other abdominal disorders.

Elephant foot yam is extensively cultivated in the south western part of Bangladesh. Farmers in the areas face many problems in field level condition. But their agronomic practices and profitability are unknown to the researchers. A limited research work was found in India (Tavva and Ramanathan, 2005; Singh *et al.*, 2014; Ghosh *et al.*, 2008; Venkatram *et al.*, 2007). But, no study on economic or financial analysis of this crop in Bangladesh has been found in the literature. Therefore, this study is expected to provide valuable information and may be useful to the researchers as well as GO and NGO policy makers for formulating appropriate policy for widespread cultivation of the crop in Bangladesh. With this view, the study was undertaken to determine profitability and resource use efficiency of elephant foot yam as well as to identify the constraints to its production and to suggest some policy implications for further improvement.

2. Methodology

Sampling design: A multi-stages sampling procedure was followed to select the study areas and sample households. At first, three elephant foot yam (EFY) growing Upazillas namely Chaugachha upazila (belong 130 ha of EFY) of Jashore district (561 ha of EFY), Kushtia sadar upazila (90 ha of EFY) of Kushtia (150 ha of EFY) district and Tala upazila (100 ha of EFY) of Satkhira (538 ha of EFY) district were purposively selected for the study due to extensively cultivated in the areas. Secondly, three villages namely Chandpara, Jhaudia and Putiakhali were purposively selected from Chaugachha, Kushtia sadar and Tala upazilla respectively for household survey according to easy commucation and concentration of EFY production. Finally, three lists of elephant foot yam growers were constructed from Chandpara, Jhaudia and Putiakhali villages where the numbers of elephant foot yam growers were 100, 243 and 80 for Chandpara, Jhaudia and Putiakhali villages, respectively. Then a total of 150 samples taking 50 samples from each village were randomly selected for data collection.

Data collection procedure: Data for the present study were collected by interviewing sample elephant foot yam growers using a pre-tested interview schedule during the period from March to September, 2017. Secondary data were also collected from Department of Agricultural Extension (DAE) to supplement the study.

Analytical techniques: The collected data were analyzed by tabular and statistical methods. The profitability of elephant foot yam cultivation was examined on the basis of gross margin, net return and rate of return over cost.

Per hectare gross return (GR), total cost (TC), total variable cost (TVC), gross margin (GM), net return (NR) and benefit cost ratio (BCR) were calculated on the basis of prevailing market price of the input and output.

GR = Return of main product= Yield × price (Tk.)

TC = All input cost including rental value of land and interest on operating capital.

TVC = All input cost except rental value of land.

NR = GR - TC

GM = GR – TVC

Benefit Cost Ratio = $\frac{Gross\ return}{Total\ cost}$

Model specification

The Cobb-Douglas production function was used to estimate the productivity of resource use efficiency of elephant foot yam cultivation. The appropriateness of this model is that the input coefficients indicate the respective elasticities (Gujarati, 2003; Suresh and Reddy, 2006 and Venkatram *et al.,* 2007). Besides, the major constraints to production were identified and they were ranked using Garret Ranking Technique.

The production function had the form as given by following equation:

$$Y = AX_1^{b1} X_2^{b2} .....X_n^{bn} e^{ui} \quad .....(1)$$

Where, Y is output and X_1 to X_n are inputs.

This function was fitted in the log-term with yield (Y) as dependent variable and inputs as explanatory or independent variables.

The production function was converted to logarithmic form so that it could be solved by least square method i.e,

$$\text{Log } Y = \text{Log } a + b_1 \log X_1 + ... + b_n \log_n + U_i \quad .....(2)$$

The empirical production function was as follows:

$$\ln Y = a + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + b_7 \ln X_7 + b_8 \ln X_8 + b_9 \ln X_9 + b_{10} \ln X_{10} + b_{11} \ln X_{11} + U_i \quad .....(3)$$

where,

Y = Yield of elephant foot yam cultivation (t ha^{-1})

a = Constant or intercept

X_1 = Labour (No. ha^{-1})

X_2 = Cost of ploughing (Tk. ha^{-1})

X_3 = Seed (Kg. ha^{-1})

X_4 = Cowdung (Kg. ha^{-1})

X_5 = Urea (Kg. ha^{-1})

X_6 = TSP (Kg. ha^{-1})

X_7 = MoP (Kg. ha^{-1})

X_8 = Zinc (Kg. ha^{-1})

X_9 = Boron (Kg. ha^{-1})

X_{10} = Cost of irrigation (TK. ha^{-1})

X_{11} = Cost of pesticides (TK. ha^{-1})

Ui = Error term

Resource use efficiency

In order to maximize profit through the efficient allocation of resources, the producer should use more of the variable resource so long as the value of the added production is greater than the cost of the added amount of resource used in the production. The straight forward way of examining such efficiency is to compare the marginal value product (MVP) with marginal factor cost (MFC) of each variable input. The efficiency of inputs used in elephant foot yam production was measured by the following equation (4). This approach was used in many past studies (Miah *et al.*, 2021; Khatun *et al.*, 2019; Ali *et al.*, 2017; Umar and Abdulkadir, 2015; Dhakal *et al.*, 2015; Abid *et al.*, 2011) for measuring the resource use efficiency.

$$MVPx/MFCx = 1 \quad \text{..... (4)}$$

The value of MVP can be estimated using the following equations (5 and 6).

$$MVPx = MPPx \times Py \quad \text{..... (5)}$$

$$MPPx = bi \times APPx = bi \times \bar{Y}\bar{X}i \quad \text{..... (6)}$$

Where,

$MVPx$= Marginal value product of ‘X’ input

MPPx = Marginal physical product of ‘X’ input

APPx = Average physical product of ‘X’ input

$MFCx$= PXi = Marginal factor cost of ‘X’ input (unit price of factor input resource)

Py = Unit price of output

bi = Elasticities or regression coefficients of the various inputs

$\bar{Y}$ = Mean of output

$\bar{X}$i = Mean of ‘X’ input factor

The resource is considered to be efficiently used and profit will be maximized when the ratio of MVP to MFC is equal to unity or MVP and MFC for each input are equal. When the ratio is greater than unity, it implies that the resource is underutilized. In that case, there is an ample opportunity to increase total production by increasing the use of specific input in the production process keeping other resources constant. When the ratio is less than unity implying the resource is overused. In that case, it is possible to reduce production cost remains total production unchanged by decreasing the use of specific input.

The relative percentage change in MVP of each resource required to obtain optimal resource allocation, which is MVP = MFC, was estimated using equation 7 below. This formula was also used in different past studies (Miah *et al.*, 2021; Khatun *et al.*, 2019; Chandra *et al.*, 2017; Gani and Omonona 2009) in home and abroad.

$$D = [1 - 1/(MVP/\ MFC)\ ] \times 100 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

Where, D = Value of percentage change in MVP of each resource. The significance of each explanatory variable was determined using the t-test.

3. Results and Discussion

3.1 Agronomic practices of elephant foot yam production

Appropriate inputs use and time of operations are essential for achieving higher yield and economic benefit. Therefore, it is important to know the existing level of technology in terms of agronomic practices, time of operation and input use. The existing level of technology employed in the production of elephant foot yam has been presented in Table 1.

Farmers in the study areas ploughed their elephant foot yam lands with the help of power tiller and tractor. The number of plowing varied from farm to farm and location to location. On an average, 79% farmers ploughed their land 4-6 times and 21 farmers ploughed their land 2-3 times for elephant foot yam production. Farmers in the study areas followed line sowing method for elephant foot yam corm planting. On an average, 67% farmers followed spacing 114 cm corm to corm and 114 cm line to line while 33% farmers followed 92 cm corm to corm and 92 cm line to line. According to areas, 100% farmers followed 114 cm corm to corm and 114 cm line to line in Kushtia and Satkhira areas while 100% farmers followed 92 cm corm to corm and 92 cm line to line in Jashore. Corm planting was started from 16 February and it continued up to the 30 April in all study areas. It is observed that early cormplanting was found in Jashore and Satkhira areas whereas late planting was found in Kushtia area. On an average, 30% farmer’s planted corms on February 16-28, 28% farmers planted on March 16-31 and 16% farmers planted on April 1-15. In Jashore, 58% farmers planted corm on February 16-28 and 42% farmers planted on March 1-31. About 88% Kushtia farmers planted

corms on April 1-30 and 64% farmers planted corms on March 1-31 in Satkhira area. Elephant foot yam was not harvested in a day. It ranged from July 16 to September 30. Majority farmers (60%) harvested it in the month of August. Weeding was done by human labour. The average weeding was found 3 times and irrigation was also 3 times by STW in all study areas.

Table 1. Agronomic practices of elephant foot yam production at farm level

Technology	Jashore	Kushtia	Satkhira	All
1. No of plowing (% of respondent)				
2-3	36	20	06	21
4-6	64	80	94	79
2. Spacing (% of respondent)				
Corm to corm: 92 cm	100	-	-	33
Corm to corm: 114 cm		100	100	67
Line to line : 92 cm	100	-	-	33
Line to line: 114 cm	-	100	100	67
3. Sowing time (% of respondent)				
February 16-28	58	-	30	30
March 1-15	16	-	18	11
March 16-31	26	12	46	28
April 1-15	-	42	06	16
April 16-30	-	46	-	15
4. Harvesting time (% of respondent)				
July 16-31	08	-	20	09
August 1-15	06	18	50	25
August 16-31	58	28	18	35
September 1-15	38	38	12	24
September 16-30	04	16	-	07
5. No. of weeding	3	3	3	3
6. No. of irrigation	3	3	3	3

3.2 Input use pattern

Human labour was employed for land preparation, corm sowing, fertilizing, weeding, pesticiding, harvesting, cleaning and washing of elephant foot yam. The average total number of human labour used for elephant foot yam cultivation was 255 man-days/ha (Table 2). The highest human labour (299 mandays/ha) were used in Satkhira area due to more use in cleaning and washing of elephant foot yam and the lowest was in Jashore (224 mandays/ha). The average elephant foot yam corm was required 10584 no./ha in all study areas, while the corms were 11719, 8480 and 11554 no./ha for Jashore, Kushtia and Satkhira, respectively. The quantity of corm was lower in Kushtia due to use higher spacing. Elephant foot yam corm was used at the rate of 6657 kg/ha in all areas. Kushtia farmers used more quantity of corm (8483 kg/ha) compared to Satkhira (6289 kg/ha) and Jashore farmers (5200 kg/ha) due to higher weight of single corm. The average

single corm weight of sample farmers of Jashore, Kushtia and Satkhira areas were 444 g, 998 g and 544 g, respectively. The single corm weight of Jashore and Satkhira is lower than the recommendation of Indian Elephant foot yam cultivation guide (750-1000 g).

The average application of cowdung, urea, TSP, MoP, gypsum, zinc sulphate and boric acid were 14.41tonnes, 387 kg, 426 kg, 289 kg, 120 kg, 14 kg and 5 kg per hectare, respectively in all study areas. The applied cowdung amount is lower and NPK are higher than recommendation of Indian Elephant foot yam cultivation guide (FYM: 25-30 tonnes, NPK: 80:60:100 kg/ha) and Azad et all., 2020, edited: TCRC, BARI, Krishi Projukti hatboi (Cowdung: 20 t/ha, Urea, TSP and MoP: 325:210:175 kg/ha). The reason of higher NPK application in study areas might be lower application of FYM. Tavva and Ramanathan (2005) found that NPK ratio was observed to be 401:189:446, 451:214:207 and 131:246:91 in Kerala, Andhra Pradesh and Tamil Nadu, respectively. According to areas, cowdung and chemical fertilizer use was varied. The highest cowdug use was found in Jashore (18.55 t/ha) and it followed by Satkhira (16.30 t/ha) and Kushtia (9.52 t/ha). The reason behind less use of cowdung in Kushtia was that only 58 percent farmers used it. But cowdung users of Jashore and Satkhira were 96% and 98%, respectively. The application of all chemical fertilizer except urea was the highest in Satkhira area compared to Jashore and Kushtia areas. Kushtia farmers used maximum urea due to less use of cowdung. The gypsum users in Jashore, Kushtia and Satkhira were 62%, 22% and 72%, respectively. The highest zinc sulphate users were found in Satkhira (80%) and it followed by Kushtia (58%) and Jashore (48%). The percentage of boric acid user in Jashore, Kushtia and Satkhira were 46%, 14% and 60%, respectively.

Table 2. Input use pattern of elephant foot yam production at farm level

Inputs	Jashore	Kushtia	Satkhira	All
Human labour (man days/ha)	224	243	299	255
Corm (no./ha)	11719	8480	11554	10585
Corm (kg/ha)	5200	8483	6289	6657
Cowdung (t/ha)	17.42	9.52	16.30	14.41
Urea (kg/ha)	269	453	438	387
TSP (kg/ha)	435	356	488	426
MoP (kg/ha)	262	219	385	289
Gypsum (kg/ha)	120	53	188	120
Zinc sulphate (kg/ha)	9	12	20	14
Boric acid (kg/ha)	5	2	8	5

3.3 Productivity and profitability

Productivity: The average yield of elephant foot yam was 26.873 t/ha in all areas (Table 3). The highest yield (28.26 t/ha) was found in Jashore due to higher use of

cowdung, TSP and bigger size of corm as well as lower attack of virus and foot and root rot disease. The lowest yield was in Satkhira (25.73 t/ha) due to higher attack of virus and foot and root rot disease. Tavva and Ramanathan (2005) found that the farmers got a yield of 33.50, 27.29 and 34.66 t/ha in Kerala, Andhra Pradesh and Tamil Nadu, respectively.

Cost: The cost of cultivation was calculated on the basis of total variable cost and total cost. The average cost of elephant foot yam production was estimated at Tk.444508/ha and Tk.409217/ha, respectively on the basis of total cost and total variable cost (Table 3). Corm cost was the lion share (55%) of total cost and it was followed by human labour (21%). Tavva and Ramanathan (2005) found that planting material (corm) cost was observed to be 40.36, 26.59 and 47.62 per cent of total cost in Kerala, Andhra Pradesh and Tamil Nadu, respectively and labour costs were 20.85, 22.78 and 19.22 per cent of total cost in Kerala, Andhra Pradesh and Tamil Nadu, respectively.

The total cost of elephant foot yam production in Satkhira area was the highest (Tk.511972/ha) among all the areas due to higher cost involved of human labour, ploughing, corm, manure, chemical fertilizer, irrigation and pesticides and the lowest total cost was in Kushtia (Tk.371030/ha) due to lower cost of human labour, corm, manure and chemical fertilizer. Corm cost was also the lion share in all the areas and it was supplied by own source. Corm is sold as a piece in the study areas and the prices of single piece of corm were Tk.23, Tk.24 and Tk.23 for Jashore, Kushtia and Satkhira, respectively. The price of Kushtia area was slightly higher compared to Jashore and Satkhira areas due to use bigger corm size. The labour wage rates of Jashore, Kushtia and Satkhira were Tk.400, Tk.300 and Tk.400, respectively. Ploughing cost was higher in Jahsore and Kushtia due to more number of plough. Farmers in the study areas ploughed the elephant foot yam land by tractor and harrow. The cost of farm yard manure of Satkhira was the highest (Tk.16303/ha) and it followed by Jashore (Tk.13154/ha) and Kushtia (Tk.9519/ha). The per kg price of cowdung was Tk.0.76, Tk.1.00 and Tk.1.00 for Jashore, Kushtia and Satkhira, respectively. Pesticides cost was higher (Tk.6632/ha) in Satkhira due to severe attack of virus and foot and root rot disease compared to Kushtia (Tk.3882/ha) and Jashore (Tk.2363/ha).

Returns: Gross return was found to be Tk.740486/ha in all study areas (Table 3). The highest gross return was calculated in Satkhira (Tk.1009318/ha) due to higher output price of local variety of elephant foot yam which is very tasty to the consumers. The lowest gross return was found in Kushtia (Tk.494833/ha) due to lower output price of madrazi variety. The reason of comparatively lower price in Kushtia is that it is far from secondary market.

Profitability: The average gross margin of elephant foot yam was estimated at Tk.331269/ha in all areas (Table 3). Gross margin was the highest in Satkhira (Tk.534846/ha) and it was followed by Jashore (Tk.272017/ha) and Kushtia (Tk.186944/ha). The average net return of elephant foot yam was calculated at Tk.295978/ha in all areas. The net return was also the highest in Satkhira (Tk.497346/ha) and it was followed by Jashore (Tk.234517/ha) and Kushtia (Tk.156069/ha). Benefit cost ratio (BCR) was found to be 1.64 on total cost basis in all areas. BCR of Jashore, Kushtia and Satkhira was 1.53, 1.42 and 1.98, respectively. Tavva and Ramanathan (2005) found that BCR was worked out to be 1.38, 1.38 and 1.50 in Kerala, Andhra Pradesh and Tamil Nadu, respectively.

Table 3. Productivity, cost, return and profitability of elephant foot yam production at farm level

Items	Jashore	Kushtia	Satkhira	All
Yield (t/ha)	28.259	26.493	25.867	26.873
Price (Tk./kg)	24.24	20.02	39.21	27.82
Cost (Tk./ha):				
Labour	89484	72988	119426	93966
Ploughing	7208	11855	12963	10676
Corm	263910	203561	267931	245134
Manure	13154	9519	16303	12992
Fertilizer	21797	21420	31670	24962
Irrigation	7974	11080	11386	10147
Pesticides	2393	3882	6632	4302
Int. on operating capital	7104	5850	8160	7038
Rental value of land	37500	30875	37500	35292
Total cost (Tk./ha)	**450524**	**371030**	**511972**	**444508**
Total variable cost	413024	340155	474472	409217
Gross return (Tk./ha)	**685041**	**527099**	**1009318**	**740486**
Gross margin (Tk./ha)	272017	186944	534846	331269
Net return (Tk./ha)	234517	156069	497346	295978
BCR (undiscounted)	1.53	1.42	1.98	1.64

3.4 Resource-use efficiency

Input output relationship: In order to determine the contribution of independent variables in elephant foot yam production, Cobb-Douglas production function was used. Before going to analyze data, multi-collinearity among the variables was checked and found no multi-collinearity in the data. The coefficients of labour, ploughing, zinc sulphate and irrigation were positive and significant at 1-5% levels, which indicated that 1% increases in those inputs keeping other factors remaining constant would increase the yield by 0.049%, 0.073%, 0.018% and 0.198%, respectively (Table 4). It implied that labour, ploughing, zinc and irrigation had positive effect on the yield of elephant foot yam production. The

coefficient of cowdung, urea, MoP, boric acid and pesticide were negative and significant at 1-10% levels, which indicated that 1% increases of those inputs, keeping other factors remaining constant would decrease the yield by 0.005%, 0.037%, 0.050%, 0.003% and 0.088%, respectively. It indicated that these inputs were used very lower dose of cowdung and boron as well as higher dose of urea, MoP and pesticides in the farmers of study areas. The returns to scale of elephant foot yam production was 0.162. This implied that production function exhibited decreasing return to scale and lied on the second stage of production. This also implied that if all inputs specified in the production function were increased simultaneously by 100%, the yield would increase by 16%. The value of the coefficient of determination (R^2) is 0.725 which indicated that around 73% of the variation in output is explained by the independent variables included in the model. The value of F is 33.659 which is significant at 1% level indicates the good fit of the model. Production function is a functional relationship between outputs and inputs (Jhingan, 2007).

Table 4. Estimated coefficients and related statistics of Cobb-Douglas production function for elephant foot yam production

Explanatory variables	Coefficients	Standard error	t-values
Constant	12.078***	0.792	12.242
LnLabour	0.049**	0.02	2.498
LnCost of ploughing	0.073**	0.029	2.506
LnSeed	0.027	0.073	0.364
LnCowdung	- 0.005***	0.002	- 2.684
LnUrea	- 0.037**	0.016	- 2.259
LnTSP	- 0.02	0.016	- 1.209
LnMoP	- 0.05***	0.016	- 3.176
LnZinc sulphate	0.018***	0.001	13.731
LnBoric acid	- 0.003**	0.002	- 2.169
LnInnrigation cost	0.198***	0.024	8.323
LnPesticide cost	- 0.088***	0.014	- 6.219
Returns to scale (RTS)	0.162		
R^2	0.73		
F-value	33.659***		
N	150		

Note: ***, ** and * indicate significant at 1%, 5% and 10% level, respectively

Resource use efficiency: The ratios of MVP and MFC for cowdung, urea, TSP, MoP, zinc sulphate and boric acid are greater than unity and positive indicating that there are ample opportunities for elephant foot yam producers to increase yield by using more of these inputs in all areas (Table 5). For labour and seed, the ratios are less than unity and negative which imply the inefficient use of these inputs. This suggests that farmers can reduce the number of labour and seed to make its use efficient. Overall, the study revealed that all the inputs used in elephant foot yam production were not optimally utilized.

It further reveals that the adjustment in the MVPs indicated that the level of input use should be increased or decreased for optimal allocation of resources. The level of use of cowdung, urea, TSP, MoP, zinc sulphate and boric acid should be increased by 100%, 78%, 34%, 89%, 85% and 70% respectively to obtain the optimum profit. On the other hand, human labour and seed were needed to decrease by 65% and 1138% for getting the highest profit.

Table 5. Estimated resource use efficiency indicators in elephant foot yam production

Variables	Coefficients	MPP	Py	MVP	MFC	MVP/MFC	Adjustment required (%)
Labour	0.049	5.16	28.6	147.69	243.7	0.61	- 65
Seed	0.027	0.11	28.6	3.12	38.6	0.08	- 1138
Cowdung	- 0.005	9.32	28.6	266.68	0.92	289.87	100
Urea	- 0.037	2.57	28.6	73.48	16.33	4.50	78
TSP	- 0.02	1.26	28.6	36.08	23.71	1.52	34
MoP	- 0.05	4.65	28.6	132.97	15	8.86	89
Zinc sulphate	0.018	34.55	28.6	988.16	150.3	6.57	85
Boric acid	- 0.003	16.12	28.6	461.14	138	3.34	70

3.5 Constraints to elephant foot yam production

The farmers in the study areas encountered some constraints to elephant foot yam production. The first ranked constraints were attack of virus disease (leaf become yellow) and foot and root rot of elephant foot yam in all study areas. It was followed by lack of technical know-how, and lack of training, as well as high price of pesticides (Table 6).

Table 6. Constraints to elephant foot yam production at farm level

Constraints	Rank value			
	Jashore	Kushtia	Satkhira	All
1. Attack of virus disease	1	1	1	1
2. Attack of foot and root rot	1	1	1	1
3. Lack of improved production technology	2	2	2	2
4. Lack of training	4	3	3	3
5. High price of pesticides	3	4	4	4

4. Conclusion

Based on the findings of the study, it may be concluded that majority farmers used Madrazi variety of elephant foot yam. Agronomic practices and input use of elephant foot yam was differed from area to area. Cobb-Douglas production function model reveals that labour, ploughing, zinc and irrigation had positive effect on yield. But resource use efficency model indicates that all inputs use were seemed to be inefficiently used in all study areas which affect net profit of the

farmers. Elephant foot yam production was found to be profitable in all study areas. Yield was hampered due to lack of improved production technology and attack of viral and fungal diseases of elephant foot yam. So, research thrust is required for varietal development, disease management and improved production technology for improvement of this important medicinal and high value crop. The gross margin and net return of elephant foot yam cultivation were positive and encouraging to the farmers. This message should be circulated among the growers through various media.

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