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Socio-economic Characteristics of the Tomato Farmers in Selected Areas of Chapainawabganj District

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ABSTRACT

The present study was undertaken to estimate the profitability of tomato production. In total 40 farmers were selected from two villages namely *Kalinagur* and *Baliadanga* under sadar upazila of Chapai Nawabganj district. Data were collected by using pre-tested questionnaire. Both econometric model description and statistical analysis were done to achieve the objectives of the study. The functional analysis indicated that the use of human labour, seeds, fertilizer, irrigation and insecticide had significant impact on net return of the tomato production. Per hectare gross cost of tomato production was Tk. 170619 and the gross return was Tk. 320112. Per hectare net returns of producing tomato was Tk. 149493. The undiscounted benefit cost ratio was found 1.87. It means that various inputs had effective contribution to increase net return of tomato production. The study reported some problems and constraints faced by the farmers during production and marketing of tomato, which were inadequate supply of good quality of seed, high price of fertilizer and insecticide, lack of irrigation, inadequate storage facilities and dominance of intermediaries. Based on the findings of the study, some recommendations are made, which are, institutional credit support, availability of quality seeds of improved varieties, control evil practice of middlemen, reduce price fluctuation and ensure fair price.

INTRODUCTION

Bangladesh is predominantly an agricultural country. Agriculture, being the mainstay of Bangladesh Economy, contributes about 14.33 percent (MoF 2013) to GDP and provides employment around 58.4 percent (BBS 2011) of its national labour force. This sector generates about 25 percent of the total foreign exchange earnings. The country is characterized by unfavorable land-man ratio, high population growth rate and low growth rate in agricultural production. To meet these challenges, the country has to enhance agricultural production through intensive method of cultivation and diversifying the production of crops. Crop as sub-sector is the most important in terms of GDP contribution, export earnings, employment opportunities and nation's food security. The continuous monoculture of cereals leads to malnutrition that affects the efficiency as well as the productivity of human labour force. At least 63.0 percent of the total population of the country had been suffering from malnutrition. Vegetables are the sources of Vitamin A, Vitamin C, carbohydrate, niacin, calcium, iron and minerals. In this context, tomato may be considered as the important diversified crop as well as concentrated sources of calorie, protein and other micronutrients. There is an acute shortage of tomato in relation to its requirement due to limitation of land; it is not possible to raise the area and production of the crop horizontally. The high demand of tomato can only be meet up by increasing its per hectare yield. This can be done by many ways of which the most important are the judicious application of fertilizers, introduction of high yielding varieties and proper management practices. Tomato is used in many food items like salad, sauces, fishes, meat, etc. It has also many medical properties. Limited numbers of studies have been done in the past to determine the socioeconomic implications of this kind of *rabi* season crop. It

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would there be pertinent to gather and analyze farm level data and information on the socioeconomic determinants of production of tomato for appropriate decision making by the farmers. The present study was undertaken with a view to determine the profitability of tomato production in some selected areas of Chapai Nawabganj district. The specific objectives to the study were i) to address the socioeconomic characteristics of the tomato farmers; and ii) to examine the marketing system of tomato.

MATERIALS AND METHODS

To attain the objectives, *Kalinagur* and *Baliadanga* two villages under Sadar upazila of Chapai Nawabganj district randomly selected for this study. Survey method was applied to collect the data. Forty farmers were randomly selected for data collection. Data were collected by direct interview during the months from January to February, 2014. Finally, the data were analyzed by using MS Excel and SPSS programs to derive the related statistics and parameters. Data were analyzed in accordance with the specified design to accomplish the objectives set for the study. Accuracy measures were taken during the period of data collection to minimize possible errors. The measures were build-in-check the questionnaire; Field checking; and Independent re-interviewing of the respondents. In studying socioeconomic characteristics, age structure, educational status, occupational status, family size, farm size and land holding pattern, livelihood patterns of the sample farmers were considered.

RESULTS AND DISCUSSION

Socioeconomic profiles of sample farmers are important in influencing production planning. There are numerous interrelated and constituent attributes that characterize an individual and profoundly influence development of his or her behavior and personality. The aims of this study is to highlight the major socioeconomic aspects such as family size and composition, classification of family members, level of education, occupational status, land holding of selected sample farmers, etc.

Age Distribution of the Tomato Farmers

Age of the respondents is an important factor in involvement in any income generating activity. The distribution of sample farmers were classified into five age groups i.e. 18 to 30 years, 31 to 40 years, 41 to 50 years, 51 to 60 years and above 60 years. As per distribution of the sample farmers, 31 to 40 years was the largest, 35 percent considering all farm (Table 1). Only 10 percent farmers were aged above 60 years. From the Table 1, it was finding that the average family size was 4.67 and 4.85, 4.57 and 4.6 for the groups of small, medium and large farmers, respectively.

Table 1. Distribution of sample farmers according to age groups

Age group	Small farmers		Medium farmers		Large farmers		All farmers	
	No.	Percent (%)	No.	Percent (%)	No.	Percent (%)	No.	Percent (%)
18-30	3	14.3	2	14.3	-	-	5	12.5
31-40	8	38.2	5	35.7	1	20.0	14	35.0
41-50	3	14.2	3	21.4	2	40.0	8	20.0
51-60	5	23.8	3	21.4	1	20.0	9	22.5
Above 60	2	9.5	1	7.2	1	20.0	4	10.0
Total	21	100.0	14	100.0	5	100.0	40	100.0

Source: Field survey, 2014.

Level of Education of the Tomato Farmers and Family Members

Education is likely to influence the farmers to adopt the modern technology and it makes them more capable to manage scarce resources efficiently so that they can earn higher profit. It is observed that 30 percent tomato farmers were illiterate and only 2.5 percent farmers completed their graduation degree. About 15 and 7.5 percent farmers had SSC and HSC education, respectively. The percentages of illiterate farmers were 47.6 and 14.3 percent for the small and medium farmers, respectively and there were no illiterate farmers in large farmers group in Table 2.

Table 2. Level of education of tomato farmers

Education	Small farmers		Medium farmers		Large farmers		All farmers	
	No.	Percent (%)	No.	Percent (%)	No.	Percent (%)	No.	Percent (%)
Illiterate	10	47.6	2	14.3	-	-	12	30.0
Primary	5	23.8	4	28.6	-	-	9	22.5
Secondary	4	19.1	4	28.6	1	20.0	9	22.5
S.S.C	2	9.5	3	21.4	1	20.0	6	15.0
H.S.C	-	-	1	7.1	2	40.0	3	7.5
Graduate and above	-	-	-	-	1	20.0	1	2.5
All groups	21	100.0	14	100.0	5	100.0	40	100.0

Source: Field survey, 2014.

Occupational Status of the Tomato Farmers

The selected tomato farmers were engaged in various types of occupations. Agriculture was their main source of employment. In the study areas, 61.9, 57.2 and 40 percent farmers are engaged in agriculture as a main occupation for the group of small, medium and large farmers, respectively (Table 3). All over 57.5, 20.0, 10.0 and 12.5 percent farmers are engaged in agriculture, business, service and others occupation, respectively. The national average of labour force in agriculture as a single major occupation was 47 percent (HIES, 2010).

Table 3. Occupational status of the tomato farmers and their family members

Occupation groups	Small farmers		Medium farmers		Large farmers		All farmers	
	No.	Percent (%)	No.	Percent (%)	No.	Percent (%)	No.	Percent (%)
Agriculture	13	61.9	8	57.2	2	40.0	23	57.5
Business	3	14.3	4	28.6	1	20.0	8	20.0
Service	1	4.8	1	7.1	2	40.0	4	10.0
Others	4	19.0	1	7.1	-	-	5	12.5
Total	21	100.0	14	100.0	5	100.0	40	100.0

Source: Field survey, 2014.

Farm Size and Land Holding of the Tomato Farmers

Different types of farm size and tenure arrangements were found in the study area which may influence the optimum resource use in the production process. The farm size can be measured by using the following formula:

Farm size = Homestead area + Owned cultivable land + Rented/Mortgaged/Leased-in land + Area under pond + Current fallow land Rented/Mortgaged/Leased-out land

The farmers were classified into three farms size i.e. small, medium and large farms. Small farmers were those who cultivated 0.51 to 1.00 ha of land, medium farmers cultivated 1.01 to 3.00 ha and those who cultivated more than 3.00 ha of land were indicated as large farmers (BBS, 2011). The small,

medium and large farmers are holding 52.5, 35.0 and 12.5 percent of total land, respectively (Table 4).

Table 4. Farm size distribution of the sample farmers

Name	Farm size	No.	Percent
Small farm	(0.51 – 1.00) ha	21	52.5
Medium farm	3.00) ha	14	35.0
Large farm	Above 3.00 ha	5	12.5
All farms		40	100.0

Source: Field survey, 2014.

Impact on Income Generation of Tomato Farmers

The income activities were classified into three categories: Farm income (crop cultivation, livestock rearing, pond fish farming, homestead etc.); Off-farm income (day labour, vehicle driving, rickshaw pulling, shop keeping, services, etc.); and Income from tomato production.

It has been found from Table 5 that the total annual income from different sources of small, medium and large farmers were Tk. 122776.4, Tk. 226538.2 and Tk. 389802.8, respectively and overall average annual income from different sources of the selected farmers was Tk. 246372.4. Annual Income from tomato production for the small, medium and large farmers were Tk. 41871.5, Tk. 74936.4 and Tk. 138263.7, respectively and which bear 34.1, 33.2 and 35.5 percent of the total income for the small, medium and large farmers, respectively. The overall average annual income from tomato production for the selected farmers was Tk. 85023.9 and it was 34.5 percent of the total income. It can be concluded that sampled farmers generated more than one-third of their income from tomato production.

Table 5. Average annual income of tomato farmers in the study area

Name	Small farmers		Medium farmers		Large farmers		Average Income	
	Income (Tk.)	Percent (%)	Income (Tk.)	Percent (%)	Income (Tk.)	Percent (%)	Income (Tk.)	Percent (%)
No. of farmers	21		14		5		40	
Farm	32284.2	26.3	88647.6	39.1	154721.2	39.7	91884.3	37.3
Off-farm	48620.7	39.6	62954.2	27.7	96817.9	24.8	69464.2	28.2
Tomato	41871.5	34.1	74936.4	33.2	138263.7	35.5	85023.9	34.5
Total	122776.4	100.0	226538.2	100.0	389802.8	100.0	246372.4	100.0

Source: Field survey, 2014

Livelihood Patterns of Tomato Farmers

Recently, with the increased use of livelihood approaches, five types of capital used namely human capital, social capital, natural capital, physical capital and financial capital.

Human capital

Human capital represents health, education, training, knowledge and access to information that together enable the tomato farmers to pursue considerable attention given to develop methods for monitoring change in all aspects of people's life. In the study areas, 70.0 percent of the tomato farmers improved their situation (Table 6).

Table 6. Livelihood status of the tomato farmers (increased)

Asset category	Percent (%)
Human capital (Health, education, knowledge etc.)	70.0
Physical capital (Building, toilet, electricity, mobile etc.)	75
Social capital (Involved in social group, Self-managerial capability, Social access etc.)	60.0
Natural capital (Cultivable land, using compost fertilizer, forests etc.)	55.0
Financial capital (Cash in hand, cash at bank/ liquid assets/savings, remittances/donation/aid etc.)	65.0

Source: Field survey, 2014.

Physical capital

Almost all the asset category showed positive trends in tomato farmers households. Building, toilet, electricity, mobile phones everything are in increasing trend. About 75.0 percent farmers increased their physical capital through tomato production (Table 6).

Social capital

In this study, involvement in social group, self- managerial capability and social access were considered as the components of social capital. Almost all the farmers' involvements in different social groups, their managerial capacity were increased at 60.0 percent (Table 6).

Natural capital

Cultivable land, using compost fertilizer and forests were addressed to determine the changing natural capital aspect which is represented in Table 6. About 55.0 percent tomato farmers increased their natural capital.

Financial capital

The changing trend of financial capital of the tomato farmers was increased. About 65.0 percent tomato farmers increased their financial capital (Table 6).

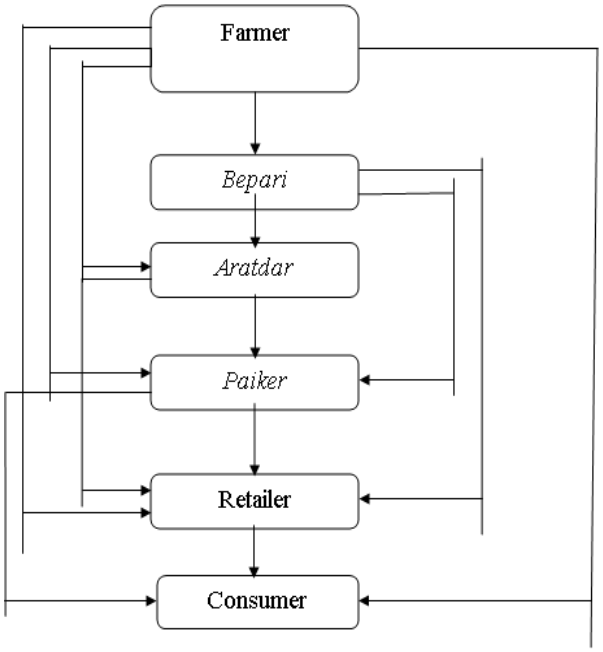
Marketing System and Marketing Margin of Tomato

Marketing system of a product means a process or system, which includes the marketing channels as well as the marketing functions that are performed by the market participants for moving the product from producers to consumers. A marketing system includes all activities involved in the flow of goods from the point of initial production to the consumer. It also plays two important roles. The role of physical distribution, which is concerned with the physical handing and transfer of products as they move from producers to consumers, and the role of adding value to farm commodities and facilitating the exchange process between buyers and sellers (Khols and Uhl, 2001).

Marketing Channels

Marketing channels are the alternative routes of product flows from producers to consumers (Khols and Uhl, 2001). The most direct channel goes from the producers straight to the consumer, but this occurs only seldom. Considering the tomato is an important vegetable in Bangladesh, the product moved from the sellers to consumer through some market intermediaries such as *Bepari, Paiker* and retailers etc. It was observed that tomato needs to move a long distance from the point of production to the consumers.

The tomato farmers were the initial link in the tomato marketing channel. In the study areas, the producers sold their product to the intermediaries such as *Bepari*, *Aratdar*, *Paiker*, retailers and consumers either in the market or at the farmyard (Flow chart 1). *Bepari* were relatively big and non-licensed traders in the study areas. They handled relatively a large volume of tomato than other traders. In the study areas, the *Bepari* purchased tomato from the farmers and sold it to *Aratdar*, *Paiker* and retailers. *Aratdar* were basically the commission agents who normally had fixed establishments in the market. *Aratdar* were big merchants and licensed traders having fixed business premises and godowns. *Paiker* were independently organized and most of them were involved in tomato trading throughout the year. They bought tomato from farmers, *Bepari*, *Aratdar* and sold it to the retailers. They acted as the sales agents and stockholders for other tomato traders. Retailers were the last link and the specialized sellers in the channel of tomato marketing who directly connected with the consumers. They did not have any permanent establishment but had fixed place to sit on the market centre. They purchased tomato from *Bepari*, *Aratdar*, *Paiker* and farmers, and finally sold their tomato in small quantity to the ultimate consumers.



Flowchart 1. Marketing channel of tomato in the study area

Marketing channels through which the tomato moved from farmers to consumers which may be shown by drawing flow chart (Flowchart 1).

Channel I: Farmer → Consumer
Channel II: Farmer → Retailer → Consumer
Channel III: Farmer → *Paiker* → Consumer
Channel IV: Farmer → *Aratdar* → Retailer → Consumer
Channel V: Farmer → *Paiker* → Retailer → Consumer
Channel VI: Farmer → *Bepari* → Retailer → Consumer
Channel VII: Farmer → *Aratdar* → *Paikar* → Retailer → Consumer
Channel VIII: Farmer → *Bepari* → *Paikar* → Retailer → Consumer
Channel IX: Farmer → *Bepari* → *Aratdar* → *Paikar* → Retailer → Consumer

Marketing Cost and Margin of Tomato

Major items of marketing cost of farmers of all groups were loading and unloading, grading, market toll, transportation, storage, packaging, wastage and personal expenses (Table 7). Total marketing cost of tomato farmers was Tk. 0.20 /kg. The major marketing cost item was for transportation which covered around 41% of total marketing cost.

Table 7. Marketing cost of farmers in study area

Cost items	Cost (Tk./kg)	Percent (%)
Transportation	0.082	41.4
Wastage	0.035	17.7
Grading	0.012	6.0
Market toll	0.030	15.0
Loading and unloading	0.015	7.6
Packing	0.010	5.3
Personal expenses	0.014	7.0
Total cost	0.198	100.00

Source: Field survey, 2014.

Marketing Cost and Marketing Margin of Intermediaries

Marketing cost represents the cost of performing various marketing functions which are required to transfer a commodity from the place of production to the ultimate consumers. Different items of cost such as loading and unloading, grading, packaging, market toll, commission, transportation, wastage, personal expenses and other costs (i.e., entertainment and tips, weighing charge, electricity charge, stationary items like papers, pad, mobile charges, etc.) were included in the intermediaries involved in tomato marketing. Marketing margin at particular stages of product may be defined as the difference between purchase and sales price of a commodity. Marketing margin of each intermediary was estimated by deducting the purchase price of tomato from its sale price while the net profit was estimated by deducting marketing cost from the marketing margin.

Marketing margin is the price for adding activities and functions performed by intermediaries (Kohs and Uhl, 2011). Marketing margin at a particular stage of transaction is the difference between sales price and purchase price while net marketing margin is the difference between the marketing margin and marketing cost for tomato marketed. Total marketing margin is the difference between the price paid by consumer and the price received by the producer. The marketing margins for tomato traders and retailers were Tk. 6.1/kg and Tk. 1.9/kg and the corresponding values for marketing profits for farmers, traders and retailers were Tk. 2.0 /kg, Tk. 3.3 /kg and Tk. 1.5/kg, respectively (Table 8). The marketing margin and the marketing profit for traders were Tk. 6.1/kg and Tk. 3.3/kg tomato, respectively. The marketing margin for the retailers was Tk. 1.9 and net marketing margin was Tk. 1.5. Net profit earned by the producers was Tk. 2.0 /kg which was only 29.4 percent of total profit earned by all the market participants. However, marketing margin and net marketing margin for all participants were Tk. 10.2 and Tk. 6.8, respectively.

Table 8. Marketing costs and margins of participants in marketing of tomato in the study area

Market participants	Production cost (Tk./kg)	Purchase price (Tk./kg)	Sales price (Tk./kg)	Marketing margin (Tk./kg)	Marketing cost (Tk./kg)	Net margin (Tk./kg)
1	2	3	4	5=4-(2+3)	6	7=(5-6)
Farmers	9.8	-	12.0	2.2	0.2	2.00 (29.4)
Traders	-	12.0	18.1	6.1	2.8	3.30 (48.5)
Retailers	-	18.1	20.0	1.9	0.4	1.50 (22.1)
All	-	-	-	10.2	3.4	6.80 (100.0)

Source: Field survey, 2014 and DAE, 2011.

SUMMARY AND CONCLUSIONS

The survey has explained the observation of the tomato farmers on various issues related to the tomato production as well as the livelihood of the households. In studying socioeconomic characteristics, age structure, educational status, occupational status, family size, farm size and land holding pattern, livelihood patterns of the sample farmers were considered. It was found that age group of 31 to 40 years was the largest group in all the cases. The literacy rates of the tomato farmers were high. The selected tomato farmers were engaged in various types of occupations. There was 57.5 percent tomato farmers engaged mainly in agriculture. Other 32.5 percent farmers also engaged in agriculture but mainly they are involved as their secondary profession. The average farm holding sizes of tomato farmers were 1.816 hectares. The livelihood patterns of the selected tomato farmers were increasing in every side. For human capital it was 70.0 percent, physical capital 75.0 percent, social capital 60.0 percent, natural capital 55.0 percent and financial capital 65.0 percent. So, it can be said that tomato production changed the farmers' standard of living. In the study areas, selected farmers faced various types of problems like lack of capital, inadequate supply of good quality seeds, high prices of fertilizers and insecticides, inadequate storage facilities, lack of marketing facilities and information, dominance of intermediaries, etc. Farmers earned higher profit from tomato production. If modern inputs and production technology can be made available to farmers in time, yield and production of tomato may be increased which can help the farmers to increase income and improve livelihood conditions. Tomato can help in improving the nutritional status of the rural people. Therefore, it may be concluded that where there is lack of irrigation facilities, farmers can profitably produce tomato instead of its others competitive crops. The present and future potential market and demand for tomato should be determined through a comprehensive study in order to take up a well-planned tomato production programme at national level. This study, therefore, confirms that the potential for increasing production through improved performance with available resources and traditional technology is limited. Efficient use of modern techniques, better management of land, institutional and infrastructural support will help to increase the tomato production. From the results of the present study, it can be concluded that considerable scope apparently exists in the study area to increase the productivity of tomato and thereby to increase income, employment and nutritional status of the farmers. This study revealed that tomato growing was more profitable than other cash crops.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interests regarding the publication of this paper.

REFERENCES

BBS 2011. Yearbook of Agricultural Statistics of Bangladesh, Bangladesh Bureau of Statistics, Statistics Division, Ministry of Planning, Government of the People's Republic of Bangladesh, Dhaka.

Bishop CE, Toussaint WD. 1985. Introduction to Agricultural Economics Analysis, Willy, New York.

Dillion JL, Hardaker JB. 1993. Farm management research for small farmer development, FAO, Rome, Italy.

MoF 2012. Bangladesh Economic Review, Economic Division, Ministry of Finance, Government of the People's Republic of Bangladesh, Dhaka.

Miah MTH. 1987. Appraisal of deep and shallow tubewell irrigation project in the Tangail district in Bangladesh, M. Ec. Dissertation University of New England, Armidale, Australia.

Rahman PMP, Ali MM. 1984. Distribution of land holding and its inequality in Bangladesh. Indian Journal of Agricultural Economics, 39(1): 40-51.

Yang WY. 1965. Methods of farm management investigation for improving farm