

Effect of Transformation of Cropland into Mango Orchard in a Selected Area of Nawabganj District

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Abstract

The objective of the study was to find out the perceived effect of transformation of cropland into mango orchard on economy, environment, household food security and social status of the mango farmers in two villages of Shibganj upazila under Nawabganj district. Data were collected from a sample of 100 farmers, out of 667, using simple random sampling procedure during 10 April to 12 May, 2014. The effect of transformation on economic, environment, household food security were considered as high by 81 percent, 80 percent and 47 percent of the mango farmers, respectively. But, the effect on social status was medium by 60 percent farmers. Mango cultivation was perceived by the farmers as economically profitable, environment friendly and it also enhances household food security as well as social status. It was concluded that mango orchard was very much beneficial for the study area people. Considering the economic benefit, environmental friendliness, ensure household food security and increase social status farmers of the study area transformed their cropland into mango orchard.

Keywords: Transformation, cropland, mango orchard, effect

Introduction

Bangladesh is a developing country inhabiting about 143.2 million of people in its 147,570 sq. km. area (BBS, 2011) and predominately an agricultural one. In this country food is the major concern at present but lack of nutrient from fruit, shortage of fuel wood and environmental degradation usually occur due to continued deforestation, may be more detrimental in the long-run. Plants are known as the world's natural air-conditioner and the earth's blanket. Without plants, this world would be an inhospitable place to live in. Plants are important for maintaining ecological balance and preserving the life-supporting system of the earth. Of all the ecosystems, plants are the largest, most

complex and self-perpetuating component (Chowdhury, 2001).

Agriculture is the largest and most important source of income and employment of the country but agricultural productivity is perhaps the lowest in the world. This is evident from per hectare production of different agricultural products in Bangladesh, compared to other countries is very low. Farmers produce much of the food in our country. They are generally much poorer than the rest of the population in the country, and less food secure than even urban people. For these reasons, they are dealing with poverty and their families face in their daily struggle for survival that lead to farmers' transformation of farming system (Sarker, 2007).

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Fruits are very essential for our daily life. For sound health, the daily requirement of fruit is 85g for person where only 35g is available (Siddiqui and Scanlan, 1995). Among the different fruits of Bangladesh, which are over fifty in number, mango has a unique position. The mango is acknowledged as the 'King of fruits'. It is recognized as one of the choicest and is well accepted fruit all over the world for its excellent flavour, attractive color, delicious taste and high nutritive value. The mangoes are rich sources of vitamin A and fairly good source of vitamin C. They contain good amount of minerals, particularly potassium (Parvin, 2005).

Cultivation of different crops not always profitable for the farmers because of unfavorable weather conditions, poor marketing facilities, low price of the products etc. Transformation of cropland into mango orchard has currently received special attention by the mango farmers of the study area. Weather of the study area is favourable for mango production. Mango is one of the most valuable fruits and mango gardening is a profitable work. Farmers get proper return from mango orchard than growing crops. As mango production/ ha is approximately 1000-1200 mound. That leads the farmers to transform their cropland into mango orchard and this has

become an important source of earning for the cultivators (Rakib, 2002).

Orchards are important for maintaining ecological balance and for preserving the life-supporting system of the earth. Environment is a very delicate aspect of any country's resources. To preserve this environment, one of the vital ways is to grow more trees. It plays a key role in our lives by protecting us from the bad effect of environment and by enhancing fruit production (Rakib, 2002). Considering the importance of orchards, mango orchards in this study area continue to increase gradually as a result of transformation of cropland into mango orchard. More than 80% farmers of the study area transform their cropland into mango orchard.

Land is a very important and scarce resource of Bangladesh. Therefore, it should be managed very carefully to ensure the best possible use of this limited resources for the benefit of the maximum number of people and their development. Transformation of cropland into mango orchard occurs for many reasons and has consequences of it. Therefore, the focus of the study was to determine the effect of transformation of cropland into mango orchard as perceived by the mango farmers.

Methodology

The study was conducted in two villages of Ghorapakhia union of Shibganj Upazila Under Nawabganj district. The study area was selected purposively for investigation, because transformation of cropland into mango orchard has been occurred there. Good communication facilities and consequently less expense for conducting the study and researcher's perception about better cooperation from the mango farmers motivated the researcher to select the area

for study. A total of 100 mango farmers were selected randomly from a population of 667 mango farmers constituted the sample of this study which was 15 percent of the total population. The empirical data were collected using personal interview method along with Focus Group Discussions during the period from 10 April to 12 May, 2014. Before collecting final data, pre-testing of the interview schedule was made to locate any defects regarding

the questions and statements. Transformation of cropland into mango orchard was the focus variable and twelve characteristics of the mango farmers were selected as explanatory variables.

In order to find out the perceived effect of transformation on economy, environment, household food security and social status of the mango farmers the researcher classified the perceived effect of transformation on economy, environment, household food security and social status of the mango farmers. The researcher collected 16 relevant transformation effect statements on four selected aspects and studying the literature relevant with transformation.

Each mango farmer was asked to indicate the opinion of transformation effect on four selected aspects by using a 4-point rating scale such "strongly agree", "agree", "moderately agree", and "not agree" and weights were assigned to these opinions as 3, 2, 1 and 0, respectively. Thus, the possible range of overall effect of transformation of cropland into mango orchard could range from 0 to 48, while 0 indicating no effect and 48 indicating high effect. The possible range of effect of

transformation on each aspect could range from 0 to 12, while 0 indicating no effect and 12 indicating high effect.

For making rank order, Effect Opinion Index (EOI) was computed. The EOI was computed by using the following formula:

$$EOI = E_{sa} \times 3 + E_a \times 2 + E_{ma} \times 1 + E_{na} \times 0$$

Where,

EOI = Effect Opinion Index

E_{sa} = No. of the respondents perceived the transformation effect as "strongly agree"

E_a = No. of the respondents perceived the transformation effect as "agree"

E_{ma} = No. of the respondents perceived the transformation effect as "moderately agree"

E_{na} = No. of the respondents perceived the transformation effect as "not agree"

Thus, the EOI of individual transformation effect could range from 0 to 300, where 0 indicating no effect and 300 indicating high effect.

Findings and Discussion

Effect of Transformation of Cropland into Mango Orchard on Overall Aspects:

The observed effect scores of the mango farmers ranged from 10-46 with an average of 33.80 and standard deviation is 1.01, where the possible score could range from 0-48. Based on their opinion on effects score, the respondents were classified into three categories as presented in Table 1.

Effect of Transformation of Cropland into Mango Orchard on Different Aspects: Table 2 shows that effect of transformation of cropland into mango

orchard was highest in economy, environmental and household food security aspects while medium in social aspects. The highest proportion of the mango farmers considered the transformation effect as high in economy (81 percent), environmental (80 percent) and household food security (47 percent) aspects while medium in social aspects (60 percent).

Table 3 shows that Opinion Indices (OI) of the mango farmers for transformation effect on selected four statements of economic

aspect ranged from 232 to 290 against a possible range 0-300.

Here, the statement 'mango cultivation is more profitable than other crops' got the highest score of 290 and hence considered as the 1st ranked as the effect of transformation on economy. Mango is a profitable crop, so farmers are interested to cultivate mango than other crops (Rice, Wheat, Sugarcane, Vegetables etc.). From mango orchard farmers can earn more money at a time (approximately 1.5-2 lakh Tk/ha) than other crops. Mango plants survive for several years. It is not necessary to take care of the mango plants every year. So, the labour and other intercultural operation cost is very low. Besides, farmers get benefit from the mango orchard every year. Farmers also earn money by selling fuel wood and dry leaf of the mango plants. Rakib (2002) was found his study that

'mango provides more earning than field crops' ranked 1st as perceived by the mango growers. He also found that transformation of flood prone lands to mango production solve unemployment problem. Hoque (2011) was found his study that economic condition became better than earlier due to fish farmers transformation from crop farming to aquaculture.

Table 1 Categorization of mango farmers according to their opinion on transformation effects on overall aspects

Respondents		Mean	Std. dev.
Category	Number		
Low (1-15)	8	.80	1.01
Medium (16-30)	3		
High (>30)	59		

Table 2 Categorization of mango farmers according to their opinion on transformation effects on different aspects

Different aspects of effects	Observed range of scores	Category	Percent	Mean	Std. dev.
Effect on economy	4-12	Low (1-4)	3	10.26	2.30
		Medium (5-8)	16		
		High (> 8)	81		
Effect on environment	6-12	Low (1-4)	0	10.23	1.77
		Medium (5-8)	20		
		High (> 8)	80		
Effect on household food security	3-10	Low (1-4)	15	7.89	2.26
		Medium (5-8)	38		
		High (> 8)	47		
Effect on social status	3-10	Low (1-4)	10	7.36	2.09
		Medium (5-8)	60		
		High (> 8)	30		

Table 3 Rank order of the effect of transformation of cropland into mango orchard on economy

Effects of transformation on economic aspects	Opinion Index	Rank Order
Mango cultivation is more profitable than other crops	290	1
Mango requires low cost of production	270	2
It gives return for several years	246	3
Generate income and employment opportunity	232	4

Table 4 shows that Opinion Indices (OI) of the mango farmers for transformation effect on selected four statements of environmental aspect ranged from 197 to 232 against a possible range 0-300.

Table 4 Rank order of the effect of transformation of cropland into mango orchard on environment

Effects of transformation on environment	Opinion Index	Rank Order
Maintain environmental balance	232	1
Prevent soil erosion	224	2
Add organic matter into the soil by fallen leaf	203	3
Maintain water level	197	4

Here, the statement 'maintain environmental balance' got the highest score of 232 and hence considered as ranked 1st as the effect of transformation of cropland into mango orchard on environment. We know that all plants receives harmful CO₂ and release essential O₂ for their survival. So, like other plants mango plant also receives harmful CO₂ and release essential O₂. As a result, CO₂ and O₂ keep in balance in the environment. Environmental function moves smoothly (e.g. respiration, food preparation by the plants, aeration, etc.). And in this way maintain environmental balance. Rakib

(2002) was found his research that transformation of flood prone lands to mango production was very much helpful to maintain the environmental balance as perceived by the mango farmers. He also found that the mango garden provides fresh air, prevent soil erosion, make bio-fertilizer by fallen leaf, maintain water level (by the root system) and trees serve as house of birds which are very essential.

Table 5 shows that Opinion Indices (OI) of the mango farmers of four selected statements of effect of transformation on household food security ranged from 126 to 175 against a possible range 0 to 300.

Table 5 Rank order of the effect on household food security of transformation of cropland into mango orchard

Effects of transformation on household food security	Opinion Index	Rank Order
Increase purchasing capability of food	175	1
Increase availability of fuel	160	2
Fulfillment of household nutritional demand	140	3
Used as alternative to food	126	4

Here, the statement 'increase purchasing capability of food' got the highest score of 175 and hence considered as the 1st ranked as the effect of transformation of cropland into mango orchard on household food security. If the income increases then farmers can easily purchase their favourite item from market. Farmers can purchase their daily necessities (food items, clothes, medicine, education materials etc.) easily. Without money it is impossible to purchase anything from the market. Increase availability of fuel and fulfilment of nutritional demand ranked 2nd and 3rd as perceived by the mango farmers. Rakib

(2002) was found his study that mango orchard fulfil nutritional demand as well as fuel demand as perceived by the mango growers. As mango is a valuable fruit, contain vitamins and minerals. Mango fruit is very much helpful for the human body. Hoque (2011) was found his research that food consumption increased due to transformation from crop farming to aquaculture.

Table 6 shows that Opinion Indices (OI) of the mango farmers of four selected statements of effect of transformation on social status ranged from 165 to 225 against a possible range 0 to 300.

Table 6 Rank order of the effect of transformation of cropland into mango orchard on social status

Effects of transformation on social status	Opinion Index	Rank Order
Increase social status	225	1
Higher interaction with people	220	2
Higher interaction with extension workers and businessmen	202	3
Get respect from others	165	4

Here, the statement 'increase social status' got the highest score of 225 and hence ranked 1st as the effect of transformation of cropland into mango orchard on social status. By cultivating mango farmers can improve their economic condition and change their life-style (e.g. improve housing condition, clothing, changing food habit, increase education rate, reduce early marriage etc.). Rakib (2002) was found his research that mango growers can maintain

friendship with the neighbours by planting mango trees together. Farmers are motivating to transform their cropland by their neighbours. Hoque (2011) was found that increase social status due to economic solvency. He also found that increase social honour and familiarity, increase leadership and increase social communication with the people of the fish farmers due to transformation from crop farming to aquaculture.

Conclusion

Based on the findings, it could be concluded that the transformation of cropland into mango orchard have effect on selected four aspects as perceived by the mango farmers. Due to transformation of cropland into mango orchard different crops were replaced by the mango. Such crops were

rice, wheat, maize, sugarcane, potato, pulse crops, mustard and vegetables. As a result farmers got much profit than growing these crops but these crops were lost.

The overall effect of transformation was high (59 percent). So, it is a vital issue for the study area. The highest proportion of the

mango farmers 81 percent, 80 percent and 47 percent considered the effect of transformation of cropland into mango orchard on economy, environment, household food security aspects as high. Sixty percent mango farmers considered the effect of transformation of cropland into mango orchard on social status as medium. The statements “mango cultivation is more profitable than other crops”, “maintain

environmental balance”, “increase purchasing capability of food”, “increase social status” got the first ranked as the effect of transformation of cropland into mango orchard on economic, environment, household food security and social status of the mango farmers, respectively. The findings of the study may be act as a baseline for the future researchers to conduct research for the improvement.

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