

CONTRIBUTION OF FARMING ENTERPRISES TOWARDS HOUSEHOLD FOOD SECURITY IN SELECTED CHARLAND OF BANGLADESH

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Abstract

The study focused on the status of food security and contribution of farming enterprises of charland towards household food security. The study was conducted in Kazipur upazila under Sirajgonj district. Data were collected from randomly selected 120 charland households heads using pre-tested interview schedule during May to June 2010. The study revealed that normal diet of charland farmer is cereal based as average per day per person rice consumption of the respondents was found higher (399.85g) than recommended dietary needs (350g) whereas majority (61.66 %) of them remained below optimum level of calorie intake and one-third (32.50 %) of them had to face food insecurity during adverse situation. Among the respondents, 46 percent were in high, compared to 29 and 25 percent in low and medium recipient of household food security from different farming enterprises. About three-fourth (74.51%) of annual dietary requirements of the households were fulfilled from the farming enterprises and rest remained unsatisfied. Among the four sectors of farming enterprises, the crop alone contributed to 61.41 percent of household food security. The farm land size and annual income showed positive and significant relationships meaning that these factors had positive and significant impact in attaining food security of the charland households. Charland people were found to have enough human and natural capitals, hence, GOs and NGOs should take necessary measures to fulfill their household food security needs and improving their living standard through different development programs.

Keywords: Contribution, farming enterprises, household food security, charland.

Introduction

The chars - some midstream islands and others attached to the mainland - are created from river sediment and are in a

constant state of formation and erosion (Mahmud 2008). Charlands are newly developed lands in different riverbeds and basins which comprise the area of

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1818400 ha (app.) in five AEZ bearing active floodplain landscapes with variable geological materials and hydrological agro-climatic conditions (Farid, 2001). Char dwellers in particular are marginalized from the benefits of mainland agricultural services due to poor communication networks (Thornton, 2000).

The whole of the charland is unstable and prone to annual flooding. The char dwellers are some of the poorest and most vulnerable people, particularly those who live on the island/attached river chars. Some charlands are old, having much population living there; some are newly born chars where few families have their settlement (Roy *et al.*, 2007).

Farming practices, in a broad sense, are a land-based activity for both annual and perennial food, fruit and cash crop including tree-crop farming, livestock-poultry rearing and fish farming. The symptoms of unsustainability of farming practices are reduction of yield; declining quantity and quality of land resources, water resources, and soil nutrient reserves (Khisha and Farid 1996). Farming enterprises functionally include all the crops, livestock, fisheries and forestry enterprises. On the otherhand, household food security expresses the economic, physical and social availability, accessibility and

sustainability of the dietary needs of the individual small farm families (FAO, 1996).

Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food for a healthy and active life (FAO, 2002). A household is considered food secured if it has the ability to meet, either from own production or through purchases, adequate food for meeting the dietary needs of all its members (Maaziya-Dixon *et al.*, 2004). The overall scenario of food security in Bangladesh indicates inadequate diet, malnutrition and hunger. Many households do not meet the basic food requirements. The rural areas where head of households, income is less than one dollar per day, often experience acute food shortages. The economic activities in rural areas are mostly primary based (PEA-primary economic activities). The rural areas particularly at the riverine flood prone areas, including charland areas, are mainly severe food deficit area; even in a good crop year, farmers face food shortages especially during the pre harvesting/lean periods. The flash flood prone areas as well as the coastal flood areas are also acute food deficit areas. Taking the above factors in to consideration, some charland areas were selected for this study with the following objectives:

- a) To estimate the present status of food security and contribution of farming enterprises to household food security in charland; and
- b) To determine the relationship between socio-economic characteristics of the respondents and contribution of farming enterprises towards household food security.

Methodology

The study was conducted in Kazipur Upazila of Sirajgonj district taking Maznabari and Charchinna villages from Monsurnagar union. Total number of farmers in the two villages was 445 which constituted population of the study of which, 120 farmers were selected randomly as the respondents covering 27 percent of active population. A pre-tested interview schedule was used to collect data from the respondents during May to June 2010. After collecting the firsthand information from the study areas, data were edited, summarized and tabulated for satisfying the objectives of the study. Tabulated data were analyzed and condensed by using SPSS program.

Estimation of food consumption, calorie intake and access to food

The crops, animal products and other food items consumed from own production and those purchased from market by the sample households were taken in to consideration for estimating

the per capita per day food and calorie intake of the charland households. For this purpose, households consumption data for the last month were collected through interviewing female household members. The selected food items were rice, wheat, tuber, pulse, vegetables, fruit, fish, meat, milk, sugar, and edible oil. The quantities of crops, animal products and other food items produced and purchased in kilogram were recorded and calculated for the energy values. Then this value was divided by the family size to obtain the calorie intake per capita per day by a household member. The tables of nutrient composition of Bangladeshi foods (Imai, 2003) were used to calculate the calorie values of the foods. Access to food was measured on the basis of ability to have meals/day by each of the family members. The respondents were directly asked to mention whether they were able to have three meals/day, two meals/day and one meal/day over a period (i.e., month) resembling Hossain's (2009) study.

Determination of contribution of farming enterprises to the household food security

The contribution of farming enterprises was determined by using the following formula:

Contribution of farming enterprises to household food security (%) = $(A/B) \times 100$

Where,

A = Total calorie obtained from farm produces per year

B = Total calorie needed by family members per year

Total calorie obtained from farm produces per year was determined with the help of a list of energy (kcal) content in 100g of different food items (Meyer, 2004). Not all the farming enterprises could be converted into energy (kcal) using this list. Problem arose when it was found that some part of the farm produces were sold out by the respondents and some item like jute and tree could not be directly converted into energy (kcal). These are obviously cash item i.e. directly related to

monetary return rather than calorific value. It was, therefore, inevitable to find out a conversion factor to be used to convert cash items into energy (kcal). Hence, following information were sought out from a Focus Group Discussion (FGD) conducted with the direct participation of the selected respondents.

Prices of the produces in the market

Food items needed to be bought by the farmers

A price of some produces which were sold out giving the monetary value in Taka were gathered. This monetary value was converted into energy following the procedure as stated in Table 1.

Table 1. Conversion of some cash items into energy

Food item needed to be bought	Monetary value (MV) (Tk. Per kg of food item)	Calorific value (CV) (kcal per kg of food item)
Rice	35	3490
Fishes	110	1360
Broiler	120	1200
Beef	230	3450
Mutton	310	1160
Soybean oil	85	9000
Fruits	100	200
Chili	100	290
Ginger	110	4320
Turmeric	90	3490
Potato	13	970
Vegetable	17	430
Coriander	140	2880
Musur dal (lentil)	90	3430
Total	MV = 1550	CV = 35670

The cash energy conversion factor was computed according to the following formula:

Cash energy conversion factor = (X/Y)

Where, X= Total calorific value of the produces, Y= Total monetary value of the produces

$$\begin{aligned} &= 35670 / 1550 \\ &= 23.01 \end{aligned}$$

This means that the calorific value of the items sold out was calculated by multiplying the monetary value (Tk.) with cash energy conversion factor. It was then added to the calorific value of the consumed food items to get the total calorie obtained from farm produces per year. On the other hand, total calorie needed by the family members was known from the average Recommended Desired Intake (RDI) (kcal/capita/day) of food item which employed the rate of dietary needs as 2187 kcal/ person/day (Anon, 2008).

Finally, contribution of farming enterprises to household food security was determined by dividing the total calorie obtained from farm produces per year by the total calorie needed by family members per year. It was then multiplied by 100 to have the contribution in percentage as described by Kobir (2007).

Coefficients of correlation (r) were computed to find out the relationship between socio-economic characteristics of the respondents and contribution of farming enterprises towards household food security.

Results and Discussion

Food security status was measured on the basis of consumption of different food items, calorie intake, number of meals taken per day by the family members of the respondent's household. A brief discussion on these issues are presented below.

Food intake measured by food consumption

Food consumption is one of the important factors for measuring the social development of a person. Usually a person's income and health consciousness improve his/her food consumption behavior in terms of consuming nutritious food. Food intake was measured as consumption of food items by the selected respondents' households. The survey included eleven most essential food items like rice, wheat, tuber, pulses, vegetables, fruit, fish, meat, milk, sugar and edible oil. Consumption of different food items are shown in Table 2.

Table 2. Consumption of different food items by the respondents' household

Nature of food item	Average consumption by a sample household (kg/month/household)	Average consumption by individual member (g/day/person)
Rice	71.48	399.85
Wheat	3.78	20.78
Tuber	7.09	39.74
Pulses	1.76	9.69
Vegetables	8.58	47.80
Fruit	2.67	16.42
Sugar	0.69	3.50
Fish	4.43	25.03
Meat	1.56	8.80
Milk	7.32	36.20
Edible Oil	1.89	10.14
Total	10.56	617.95

Food consumption scenario as mentioned in Table 2 reveals that among consumption of all the eleven food items rice is dominant over others i.e. food consumption of the respondents households are cereal based. To persuade people to reduce rice consumption from the current level of 399.85 gm to 350 gm taken per day would not be easy and will require rapid, broad-based economic growth and reduction of inequalities. Such a dietary shift would also eradicate micronutrient deficiency as a public health problem.

Food security status as in calorie intake

Based on the calorie intake the respondents were classified into four categories similar with Hossain (2009). These were: 'much below optimum' (upto 1800 kcal), 'below optimum' (>1800-2122kcal), 'optimum' (>2122-2444kcal) and 'above optimum' (>2444kcal). Distribution of the respondents according to their calorie intake (per capita/day) are shown in Table 3.

Table 3. Food security status of the respondents according to their calorie intake

Categories	Number	Percent	Mean	SD
Much below optimum (upto1800 kcal/capita/day)	31	25.83	1776.00	240.08
Below optimum (>1800-2122 kcal/capita/day)	43	35.83		
Optimum (>2122-2444 kcal/capita/day)	40	33.33		
Above optimum (>2444 kcal/capita/day)	5	4.17		
Total	120	100		

Data contained in Table 3 reveal that above one -fourth (25.83 %) of the respondents were found to take much below optimum level calorie, more than one-third (35.83 %) of the household members had taken below optimum level calorie and one - third (33.33 %) of the sample household members took optimum level and very negligible proportion (4.17 %) of the household members took above optimum level calorie. The average calorie intake (1776kcal/capita/day) of the sampled charland household was much lower than national average (2239 kcal/capita/day).

Food security status in access to food (meals per day)

The food security status was measured by another dimension i.e., number of full meals taken per day over the month of a year. Though charland areas are prone to early and late flooding, and so number of full meals taken per day is decreased during flooding season or any other natural hazards especially for marginal or small farmers. Number of full meals taken by the family members/day is shown in Table 4.

Table 4. Distribution of the respondents based on number of meals taken per day

Status of access to food	Normal situation		Adverse situation	
	No.of respondents	Percent	No.of respondents	Percent
Three meals/day	120	100	81	67.50
Two meals/day	-	-	39	32.50
One meal/day	-	-	-	-

Data presented in Table 4 reveal that on an average, cent percent of the family members of the respondents take three meals in normal situation. But, during adverse situation, 67.50 percent of the family members of the respondents take three meals and about one-third (32.50 %) of the family members of the respondents take two meals. Reason behind the insecure condition might be due to damage of crops and livestock, lack of scope for labor utilization and income generation activities both by male and female members of the households.

Contribution of farming enterprises towards household food security

Charland farmers operate various farming enterprises, such as crops, fisheries, livestock and poultry, and forestry in their holdings. The

contribution of farming enterprises of the respondents to their household food security has been given in Table 5. The observed range of contribution varied from 9.75 to 246.95 percent with an average of 74.51 percent and standard deviation 54.20. Among the respondent farmers, 45.83 percent received high level of contribution while 25 percent and 29.17 percent of them received medium and low level of contribution, respectively from their farming enterprises towards the household food security. Kobir (2007) conducted a study on contribution of farming enterprises on food security among small farmers and found that 56.6 % received medium level of contribution while 26.7 and 16.7% of them received low and high level of contribution respectively.

Table 5. Contribution of farming enterprises towards household food security of the respondents

Categories	Number	Percent	Mean	SD
Low (below 33)	35	29.17	74.51	54.20
Medium (33 to 67)	30	25.00		
High (above 67)	55	45.83		Observed range
Total	120	100		(%) = 9.75-246.95

The main reason behind high range and standard deviation of the respondents might be land ownership and ownership structure of different farming enterprises by the respondents. Most of the respondents had land area of 0.2 to 1.00 ha. This land was not completely

owned by the respective respondents rather cultivated as sharecropping, lease and mortgaged. In case of sharecropper small farmers, decision making capacity retained mostly to the land owners. Consequently, crop diversification and intensification could not be possible to

adopt by the respondents leading to poor achievement of household food security. Overall contribution of the farming enterprises of the respondents' farmers

to their household food security has been further partitioned into major farming enterprises are presented in Table 6.

Table 6. Contribution of the major farming enterprises of the respondents

Farming enterprises	Range (%)		Mean
	Possible	Observed	
Crops	Unknown	7.45 - 208.99	61.41
Livestock	Unknown	2.07 - 64.74	10.52
Fisheries	Unknown	0.14 -7.93	1.13
Homestead forestry	Unknown	0.03 -7.17	1.45

Findings in Table 6 revealed that among the four major sectors of farming enterprises, crop sector alone contributed 61.41 percent to the household food security followed by livestock 10.52 percent, fisheries 1.13 percent and homestead forestry 1.45 percent.

For further clarity of the contributions of major farming enterprises of the respondent farmers to the household food security, a pie-graph has been shown in Figure 1.

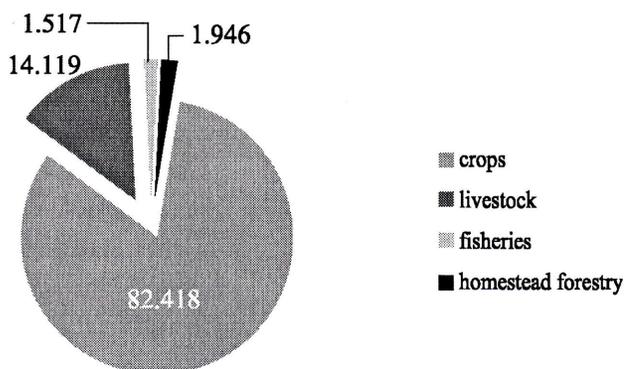


Figure 1. Comparative contribution of farming enterprises of the respondents to household food security.

Findings in Figure 1 show that crop enterprises contributed to 82.418 percent of the total contribution of the four major sectors of farming enterprises of the respondents.

While 14.11 percent contribution was obtained from livestock rearing, 1.51 percent from fish culture and 1.94 percent from homestead forestry cultivation. Kobir (2007) conducted a study on contribution of farming enterprises on food security among small farmers and found that 93 percent of total contribution was received through crop sector whereas 5% from livestock and 1% from both fisheries and fruits cultivation.

These findings led to the conclusion that the charland farmers emphasized crop cultivation as the prime means for their household food security. Total contribution of different farming enterprises to the household food security became 74.51 percent. This meant that the rest 25.49 percent of the annual dietary needs of the respondents' charland families remained unsatisfied. It is a matter of sorrow that the charland farmers could not achieve the expected contribution from their farming enterprises as even one-fourth of their household food security was not as per recommended desired intake of the family.

Relationship between socio-economic characteristics of the respondents and contribution of farming enterprises towards household food security

Findings shown in Table 7 indicate that age, education, farming experience and contact with the sources of information of the charland farmers were not an important indicator concerning the contribution of farming enterprises towards household food security. Miah *et al.* (2010) found that education has no effect on food security among indigenous people. Family size was significantly and negatively correlated. That is, family size of the respondents greatly influenced their achievement of household food security from their farming enterprises. As the amount of calorie needed by the family increases with the increase of the number of family members, hence, the contribution of the farming enterprises to household food security was, of course, decreased with the increase of family requirements. This finding is consistent with the result found by Miah *et al.* (2010) and Kobir (2007). Farm size was found positively and significantly correlated with contribution of farming enterprises towards household food security. Obviously, greater land areas facilitated to practice more number and quantity of farming enterprises. This finding is

consistent with the result found by Najafi (2003), Miah *et al.* (2010) and Kabir (2007). On the other hand, annual income was highly positively and significantly correlated with contribution of farming enterprises towards household food security. Higher annual family income of the

charland farmers makes them more courageous to adopt diversified farming enterprises. Moreover, they can meet up the family needs at the expense of their income. This finding is consistent with the result found by FAO (2002), Miah *et al.* (2010) and Kabir (2007).

Table 7. Correlation coefficient between socio-economic characteristics of the respondents and contribution of farming enterprises towards household food security

Socio-economic character	Coefficient of correlation (r)
Age	-0.154
Education	0.016
Family size	-0.197(*)
Farm size	0.326(**)
Annual income	0.418(**)
Farming experience	-0.167
Contact with the sources of information	0.138

* Correlation is significant at the 0.05 level.

** Correlation is significant at the 0.01 level.

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