# ***Original Research Article***

**Contribution of Farming Enterprises of the Marginal Farmers towards Household Food Security**


## ABSTRACT

The goal of the study was to ascertain how marginal farmers' farming operations impacted household food security. Additionally, efforts were undertaken to identify the challenges marginal farmers faced in achieving household food security. The majority of marginal farmers (51%) fell into the medium group in terms of the contribution of farming enterprises to household food security, while 37% fell into the low category. More over half of the family's food requirements were still unmet by the farming operations, which only met 40% of them annually. The biggest %age (42%) of the four farming enterprise categories came from crops alone. Among the ten traits of the marginal farmers, the size of the farm and the yearly family income were positively connected, whereas the size of the family, the annual nutritional demands of the family, and cropping intensity practiced were negatively correlated. The remaining traits were not significantly correlated with how much farming operations contributed to household food security. Lack of suitable land for farming, poor training facilities, and ignorance of various facets of better farming enterprises were the main challenges marginal farmers faced in achieving household food security.


***Key words****: Marginal farmers, household food security, farming enterprises.*



## 1. INTRODUCTION

Bangladesh, a country that covers an area of 1,47,570 square kilometer, is one of the predominantly agro-based developing countries in the world [1]. Agriculture has a significant role in contributing to rural economic growth and ensuring food security [2]. Food is a fundamental human need and is important to Bangladesh's agro-based economy, as a significant amount of the population's income goes toward purchasing food. The widely accepted World Food Summit (1996) definition reinforces the multidimensional nature of food security and includes food access, availability, food use, and stability as the components of food security. Bangladesh has made commendable

progress over the past 40 years in achieving food security, despite frequent natural disasters and high population growth [3]. Despite Bangladesh's rapid advancements in food production and increased capacity for commercial exports, food security remains a significant issue due to a lack of purchasing power and, consequently, of access to food [4]. A sizable section of the rural population lacks access to land and relies on temporary employment for survival. Millions of people experience chronic and sporadic food insecurity as a result of the seasonal nature of agricultural employment and poor employment options in the non-agricultural sector. The Food and Agriculture Organization of the United Nations (FAO) defines household food security in 2010 as the ability of a household to consistently supply members of the family with enough food for individual body needs without fears of shortage. Not simply enough food must be available for everyone. It demands that individuals have easy access to food and a "entitlement" to it, whether they do so by producing it themselves, purchasing it, or via a public food distribution system. Food supply is therefore a necessary but insufficient prerequisite for security. The household food security program has three components: accessibility, stability, and availability. As producers, handlers, and marketers of businesses centered on food, marginal farmers have unique challenges. The majority of them sharecrop other people's land, where they have limited decision-making power. They are unable to diversify their lands by incorporating different agricultural practices or intensify by growing more crops on the same area each cropping year. As a result, their harvest output is lower than anticipated. Thus, they are forced to live with poverty, fragility, physical weakness, starvation, etc. This idea of marginal farmers is a prevalent one in Bangladesh's rural areas. However, they carry out a variety of subsistence farming activities in a constrained area, including the production of rice, wheat, jute, potatoes, spices, cattle, and fruits. The farm's products cover all of the family's expenses. The paradigm of household food security is still not taken into account. In this context, it could be worthwhile to evaluate how marginal farmers' farming operations contribute to household food security.



## 2. METHODOLOGY

The study was conducted in three villages, namely Biltakapora, Bildhamu, and Bakshadangi, of Narua union under Baliakandhi upazila of Rajbari district, which were randomly selected. Out of 500 marginal farmers in these three villages, 120 (26% of the total population) were chosen at random. From January 5 to February 20, 2009, data

was gathered through direct interviews with marginal farmers. The contribution of farming enterprises of marginal farmers towards household food security was the dependent variable, and the selected ten socio-personal characteristics of the marginal farmers constituted the independent variables of the study.

**2.1 Dependent Variables Measurement**

Contribution of farming enterprises towards household food security (%) = Total calorie obtained from farm produces per year / 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 100 g of different food items [5]. Not all the farming enterprises could be converted into energy (kcal) using this list. Problem arose when it was found that some parts 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).

Cash energy conversion factor = Total calorific value of the produces / Total monetary value of the produces.

**2.2 Independent Variables Measurement**

The age of a respondent was measured in terms of years from birth to the time of interview, which was found on the basis of response. Education was measured in terms of one's year of schooling. One score was given for passing each level in an educational institution. For example, if an SSC examination score was given as 10, while a respondent did not know how to read and write, his score would be '0'. Family size was measured by the total number of members in the family of a respondent. The annual dietary needs of the family were measured on the basis of the body weight of the family members. It was assumed that 40 calories of energy were needed per kilogram of body weight per day [6].

The dietary needs of the family per annum were then calculated from the total body weights of all family members at the rate of 40 calories per day/kg body weight [7]. One unit score was given for every thousand kilocalories of energy. The farm size of a respondent referred to the total area of land on which his family carried out farming operations, the area being in terms of full benefit to the family. The total financial return

of a household from farm (crops, livestock, poultry, and fish) and non-farm sources (business, jobs, remittances, and others) in one year is referred to as annual income. It was expressed in Taka. Credit received by a respondent was measured in terms of the amount of money received by his family members as loans from different sources. A score of one was given for each thousand taka [7]. Daily time allocation refers to how much time marginal farmers spend on farm activities per day, and it is expressed in hours per day. Attempt was made to know the time allocation of non-farm activities like household work, social activities, rest, sleep, and others [8]. Exposure to farming information was scored against a four-point rating scale as 0 for "not at all", 1 for "rarely", 2 for "occasionally" and 3 for "regularly". The pattern of land use by the marginal farmers and the cropping intensity practiced by them on their own farm land were measured. At the beginning, single, double, triple, and quadruple cropped areas of the respondents were asked. A four-point rating scale was used to compute the problem score of a respondent. For each problem, a score of ‘3’, ‘2’, '1', and ‘0’ was assigned to indicate the extent of the problem as ‘high’, ‘medium’, 'low', and ‘not at all', respectively.

## 3. RESULTS AND DISCUSSION

The basic statistical values of the independent variables of the respondents are presented in Table 1, where the age of the marginal farmers ranged from 22 to 60 years, with a mean of 38.21 years and SD of 7.10. The level of education of the small farmers ranged from 0–10, the average being 4.52 with a SD of 3.16. With a standard deviation of 1.37, based on the family size score, the respondents were classified into three categories. Table 1 indicates that 49.2 % of the farmers had a small family size, 44.1% of them had a medium family size, and 6.7 % had a large family size. Findings reveal that about half of the marginal farmers had a small family size. According to the observed value of the annual dietary needs of the family among the marginal farmers, the majority (60 %) needed a medium number of calories, 32.5 % needed a low amount, and the rest, 7.5 %, needed a high number of calories. The average farm size of the marginal farmers ranged from 0.021 to 0.20 ha, with an average of 0.43 ha and a standard deviation of 0.17 ha. According to Table 1, the majority of marginal farmers (63.3 %) had 0.021 to 0.080 ha of land area, 30.9 % had 0.081 to 0.170 ha, and the remaining 5.8 % had 0.171 to 0.20 ha of land area. Based on the observed information, it is clear that most of them had fewer land holdings than the average farm size.

**Table 1: Characteristics profile of the respective marginal farmers**

| Characteristics (measuring unit) | Range | | Respondents | | | Mean | Std. Dev. |
|---|---|---|---|---|---|---|---|
| | Pos. | Obs. | Category | No. | % | | |
| Age (year) | - | 22-60 | Young (≤30) | 29 | 15.8 | 38.21 | 7.10 |
| | | | Middle-aged (31-45) | 86 | 71.7 | | |
| | | | Old (>45) | 15 | 12.5 | | |
| Education (years of schooling) | - | 0-10 | Illiterate (0) | 16 | 13.3 | 4.52 | 3.16 |
| | | | Primary education (1-5) | 70 | 50.0 | | |
| | | | Secondary education (6-10) | 44 | 36.7 | | |
| Family size (number) | - | 2-10 | Small family (≤4) | 69 | 49.2 | 4.75 | 1.37 |
| | | | Medium family (5-6) | 53 | 44.1 | | |
| | | | Large family (>6) | 8 | 6.7 | | |
| Annual dietary needs of the family ('000' kcal) | - | 1.74-6.81 | Low (<3) | 44 | 32.5 | 3.48 | 1.03 |
| | | | Medium (3-5) | 77 | 60.0 | | |
| | | | High (>5) | 9 | 7.5 | | |
| Farm size (ha) | - | 0.021-0.20 | 0.021-0.080 ha | 86 | 63.3 | 0.43 | 0.17 |
| | | | 0.081-0.170 ha | 37 | 30.9 | | |
| | | | 0.171-0.20 ha | 7 | 5.8 | | |
| Annual family income ('000' Tk.) | - | 31-135 | Low (≤50) | 35 | 20.8 | 71.24 | 21.00 |
| | | | Medium (51-100) | 83 | 69.2 | | |
| | | | High (>100) | 12 | 10.0 | | |
| Credit received ('000' Tk.) | - | 0-905 | Low (≤20) | 120 | 95.8 | 13.87 | 82.34 |
| | | | Medium (21-40) | 6 | 3.4 | | |
| | | | High (>40) | 4 | 0.8 | | |
| Daily time allocation in farm work (hour per day) | - | 1-10 | Low (<3) | 14 | 7.5 | 6.85 | 2.48 |
| | | | Medium (3-6) | 35 | 29.2 | | |
| | | | High (>6) | 81 | 63.3 | | |
| Exposure to farming information (score) | 0-30 | 3-18 | Less (≤10) | 93 | 69.2 | 9.08 | 3.08 |
| | | | Moderate (11-20) | 37 | 30.8 | | |
| Practiced cropping intensity (%) | - | 200-300 | Low (200-233) | 43 | 31.7 | 246.87 | 23.17 |
| | | | Medium (234-266) | 60 | 45.8 | | |
| | | | High (267-300) | 27 | 22.5 | | |

*Note: Pos. = Possible, Obs. = Observed and Std. Dev. = Standard Deviation*

The highest proportion of the respondents (69.2 %) had medium annual family income, while 20.8 and 10 % of them had low and high annual family income, respectively. The findings show that the majority of respondents (90 %) had low to medium annual family income, indicating the current situation of marginal farmers. Data furnished in Table 1 indicates that the highest proportion (95.8 %) of the marginal farmers had low credit received, while 3.4 % had medium credit received, and the rest 0.8 % had high credit received. The marginal farmers' daily time allocation in farm work ranged from 1 to 10 hours per day. The average and standard deviation of the time spent on farm work were

6.85 and 2.48 hours per day, respectively (Table 1). The observed data shows that most of the marginal farmers (63.3 %) spent more than six hours a day doing farm work, while 29.2 and 7.5 % of them allocated medium and short time for farm work, respectively. Table 2 indicated that the observed range of contribution varied from 10.03 to 96.45 %, with an average of 44.78 % and a standard deviation of 17.97 %. More than half of the responding marginal farmers (56.6 %) received a medium level of contribution from their farming enterprises toward household food security, while 26.7 and 16.7 % received low and high levels of contribution, respectively.

**Table 2: Contribution of farming enterprises towards household food security**

| Range (%) | | Respondents | | | Mean | Std. Dev. |
|---|---|---|---|---|---|---|
| Possible | Observed | Category | No. | % | | |
| Unknown | 10.03-96.45 | Low (<33) | 37 | 26.7 | 44.78 | 17.97 |
| | | Medium (33-67) | 79 | 56.6 | | |
| | | High (>67) | 14 | 16.7 | | |

Overall contribution of the farming enterprises of the marginal farmers towards household food security has been further partitioned into major farming enterprises as presented in Table 3.

**Table 3: Contribution of the major farming enterprises of the marginal farmers**

| Farming enterprises | Range (%) | | Mean | Std. Dev. |
|---|---|---|---|---|
| | Possible | Observed | | |
| Crops | Unknown | 8.74-96.14 | 41.70 | 17.21523 |
| Livestock | Unknown | 0.01-23.86 | 2.15 | 3.50274 |
| Fisheries | Unknown | 0.00-7.03 | 0.47 | 1.01742 |
| Fruits | Unknown | 0.00-2.53 | 0.46 | 0.60923 |

Marginal farmers' overall contribution to household food security: the crop sector alone contributed 41.70 %, followed by livestock (2.15 %), fisheries (0.47 %), and fruits (0.46 %). Information presented in Table 4 reveals that most of the farm's products (81.57 %) are sold out for other household purposes. More than 90% of the livestock, fisheries, and fruit sectors' output was sold. Crops were sold out comparatively lower than other products. Among the crops, rice is hardly sold out because the marginal farmers of the study area were not able to produce rice according to their family needs. The other farm products were mainly sold out to purchase rice, fish, meat, and other household necessities.

**Table 4 Average calorie productions, consumption and sold out proportion**

| Farming enterprises | Production (Kcal) | Consumption (Kcal) | Sold out (Kcal) |
|---|---|---|---|
| Crops | 1364.722 | 265.908 (19.48%) | 1098.814 (80.52%) |
| Livestock | 68.545 | 1.556 (2.27%) | 66.989 (97.73%) |
| Fisheries | 14.898 | 1.003 (6.73%) | 13.895 (93.27%) |
| Fruits | 15.227 | 1.231 (8.08%) | 13.997 (91.92%) |
| Total | 1463.393 | 269.698 (18.43%) | 1193.695 (81.57%) |

**Relationships between Independent and Dependent variables**

**Age and contribution of farming enterprises:**

The correlation coefficient between the age of marginal farmers and the contribution of their farming enterprises towards household food security was 0.118, where the computed 'r' value was non-significant. Hence, the concerned null hypothesis could be accepted. Thus, it could be said that the age of the respondents could not significantly influence their achievement of household food security through their farming enterprises. Moreover, age was positively correlated with family size; annual dietary needs of the family, credit received, and practiced cropping intensity. The former variables had a negative impact on farming enterprises' contribution to household food security, while the latter had a positive impact.

**Education and contribution of farming enterprises:**

The correlation coefficient showed a positively non-significant relationship between the education of marginal farmers and their farming enterprises towards household food security was 0.016 (Table 5). So, the concerned null hypothesis could be accepted. It could be concluded that the education of the respondents could not influence their achievement of household food security through their farming enterprises. The majorities of marginal farmers were illiterate or had only completed primary school.

**Family size and contribution of farming enterprises**:

This correlation coefficient was -0.48 based on the computed 'r' value and was negatively significant. Hence, the null hypothesis could not be rejected. It means that the family size of the respondents greatly influenced their achievement of household food security through their farming enterprises. The amount of calories needed by the family increases with the increase in the number of family members, where family size decreases with the increase in family requirements.

**Farm size and contribution of farming enterprises:**

The correlation coefficient between them was 0.421, which means positively significant. The concerned null hypothesis could be rejected. Obviously, more land area facilitates a greater number and quality of farming enterprises.

**Annual dietary needs of family and contribution of farming enterprises:**

This correlation coefficient was -0.514, which means that there is a negative relationship between them. It could be concluded that the annual dietary needs of the family of respondents were an important indicator for the assessment of the contribution of farming enterprises. Food security has a direct linear relationship with the dietary needs of a family.

**Daily time allocation in work and contribution of farming enterprises:**

This correlation coefficient was 0.016, which means that there was a positive relationship. It could be concluded that daily time allocation in farm work of marginal farmers was not dominant in their achievement of household food security.

**Table 5: Relations between dependent and independent variables**

| Characteristics of the marginal farmers | 'r' value with 118 d.f. |
|---|---|
| Age | -0.118 |
| Education | 0.016 |
| Family size | -0.480** |
| Annual dietary needs of the family | -0.514** |
| Farm size | 0.421** |
| Annual family income | 0.392** |
| Credit received | -0.072 |
| Daily time allocation in farm work | 0.016 |
| Exposure to farming information | 0.039 |
| Practiced cropping intensity | -0.234* |

** Significant at 1% level of probability, * Significant at the 5% level of probability.

**Problems faced by the marginal farmers in achieving household food security**

**Table 6: Problems faced by marginal farmers in achieving household food security**

| Range of score | | Respondents | | | Mean | Std. Dev. |
|---|---|---|---|---|---|---|
| Possible | Observed | Category | No. | % | | |
| 0-30 | 5-20 | Low (≤10) | 8 | 2.5 | 15.07 | 2.46 |
| | | Medium (11-20) | 122 | 97.5 | | |
| | | High (>20) | 0 | 0 | | |
| Total | | | 120 | 100 | | |

Table 6 shows the extent of marginal farmers' problems in achieving household food security in terms of the Problem Facing Index (PFI), as well as their rank order based on the PFI values. Data furnished in the Table 6 indicates that the problem which was ranked first was ‘inadequate land for farming', followed by the second ranked ‘inadequate training facilities', and the third ranked ‘lack of contact with communication media’. "Non-cooperation of family members" was the least important problem among those faced by marginal farmers in achieving household food security.

**Table 7: Ranking of problems according to descending order**

| Rank order | Problems | PFI |
|---|---|---|
| 1 | Inadequate land for farming | 358 |
| 2 | Inadequate training facilities | 336 |
| 3 | Lack of contact with communication media | 291 |
| 4 | Insufficient credit | 271 |
| 5 | Lack of money | 202 |
| 6 | Lack of time | 156 |
| 7 | Lack of knowledge of different aspects of farming enterprises | 96 |
| 8 | Lack of personal interest | 92 |
| 9 | Social and religious restriction | 6 |
| 10 | Non-cooperation of family members | 4 |

## 4. CONCLUSION

The findings of the study indicates that the highest proportion of the respondents (56.6%) were in the medium category regarding the achievement of their household food security. Moreover, 55.22% of annual dietary needs remained unsatisfied. Small family size is desirable to attain more contribution from farming enterprises towards household food security. Farm size and annual family income were positively correlated with the contribution of farming enterprises to household food security. A larger farm size leads to earning a higher annual income. Though practiced cropping intensity showed a negative relationship with the contribution of farming enterprises towards household food security, it could be helpful to increase the level of contribution of farming enterprises if cropping intensity could be increased by marginal farmers having comparatively larger farm size. Most farmers faced a medium level of different problems in achieving household food security.

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