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The Role of Marginal Farmers' Farming Enterprises in Ensuring Household Food Security

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

The goal of this 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 attaining household food safety. Due to this, the study was carried out in three randomly chosen villages in the Rajbari district's Baliakandhi upazila. In these three communities, out of 500 marginal farmers, 26% of the populace was randomly selected. Data was acquired through direct interviews with marginal farmers between January 5 and February 20, 2009. The majority of marginal farmers (51%) fell into the medium group in terms of the contribution of farming enterprises to domestic food safety, 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 percentage of age (42%) of the four farming enterprise categories came from crops alone. Among the ten traits of the marginal peasants, 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.

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1. INTRODUCTION

Bangladesh, a country that covers an area of 147570 square kilometers, is one of the mostly agro-based emerging countries in the world [1]. Food security is ensured and agriculture plays a vital role in rural economic growth [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. Food access, availability, utilization, and stability are all included as elements of food security in the generally accepted World Food Summit (1996) definition, which emphasizes the concept's multidimensionality. Despite numerous natural disasters and rapid population increase, Bangladesh has made admirable progress toward ensuring food security over the past 40 years [3]. Food security is still a major problem in Bangladesh despite the country's remarkable gains in food production and greater capacity for commercial exports because of a lack of purchasing power and, subsequently, of access to food [4]. A sizable section of the rural population lacks access to land for farming and so 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. There must be more than just adequate food for everyone. It mandates that people have "entitlement" to food and simple access to it, whether they obtain it through self-production, purchase, or participation in 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 pattern 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. To the best of the researcher's knowledge, there haven't been enough studies on how marginal farmers' farming ventures affect their ability to feed their families. So this study was carried out to know the marginal peasants' farming enterprises' contribution to household food safety.

2. METHODOLOGY

Three randomly chosen villages from the Narua union in the Baliakandhi upazila of the Rajbari district—Biltakapora, Bildhamu, and Bakshadangi—were used for the study. The marginal peasant' farming enterprises' contribution to household food security served as the dependent variable and the study's independent variables were 10 socio-personal traits that were chosen from their range.

2.1 Measurement of Dependent Variables

Contribution of farming enterprises towards household food security (%) = Total calorie obtained from farm produces per year / Total calorie needed by family members per year. A list of the energy (kcal) value in 100 g of various food items was used to calculate the total number of calories gained from farm products each year [5]. Not all farming activities could be translated using this list into energy (kcal). The issue occurred when it was discovered that some farm products had been sold out by the respondents and that some products, like jute and trees, could not be transformed directly into electricity (kcal). These are unmistakably cash items, meaning they are directly linked to monetary return as opposed to caloric value. Finding a conversion factor to be used to transform financial items into energy was therefore inevitable (kcal).

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

2.2 Measurement of Independent Variables

Based on their responses, each respondent's age was calculated as the number of years since their birth up until the interview. One's school year served as the standard unit of education measurement. For completing each stage in an educational setting, one score was awarded. For instance, if a person received a score of 10 on the SSC exam but was illiterate, his score would be "0." The total number of family members in a respondent's household served as the benchmark for family size. Based on each family member's body weight, the annual dietary requirements were calculated. It was assumed that 40 calories of energy were needed per kilogram of body weight per day [6].

The family's yearly nutritional requirements were then determined using the combined body weights of every family member at a rate of 40 calories per day/kg body weight [7]. For every kilocalorie of energy, one unit was awarded. The whole area of land used by a respondent's family for farming operations, measured in terms of the area's complete utility to the family, was referred to as the respondent's farm size. Annual income is the sum of a household's financial gains from both agricultural (crops, livestock, poultry, and fish) and non-agricultural (business, employment, remittances, and other) sources throughout a given year. Taka was used to express it. 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 respondent's credit score was calculated based on how much money his family members had borrowed from various institutions. For every thousand taka, a score of one was assigned [7]. Daily time allocation, which is measured in hours per day, is the amount of time marginal farmers spend on farm tasks each day. A study was conducted to determine how much time was spent on non-farm activities like housework, socializing, resting, and sleeping [8]. On a four-point rating scale, exposure to farming-related information was given a score of 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. The problem score of a respondent was calculated using a four-point rating system. A score of 3, 2, 1, or 0 was given for each issue to denote the problem's high, medium, low, or not at all severity, respectively.

3. RESULTS AND DISCUSSION

3.1 Descriptive Analysis

Table 1 shows the descriptive statistics for the independent variables. The marginal farmers' ages ranged from 22 to 60 years old, with a mean age of 38.21 years and a standard deviation of 7.10. The small farmers' educational attainment ranged from 0 to 10, with an average score of 4.52 and a standard deviation of 3.16. Based on the family size score, the respondents were divided into three groups with a Standard Deviation of 1.37. Table 1 indicates that 49.2% of the farmers had a small family size (≤4), 44.1% of them had a medium family size (5-6) and 6.7% had a large family size (>6) where the standard family size is 4.6 in Rajbari or study area [9]. According to the research, just approximately half of the marginal farmers had large families. The majority of marginal farmers (60%) required a medium number of calories, 32.5% required a low amount, and the remaining 7.5% required a high number of calories, according to the observed value of the annual dietary demands of the family. The marginal farmers' farms ranged in size from 0.081 to 0.170 ha on average, with a standard deviation of 0.17 ha. Table 1 shows that the bulk of marginal farmers (63.3%) had land areas between 0.021 and 0.080 ha, followed by 30.9% by 0.081 to 0.170 ha, and 5.8% by 0.171 to 0.20 ha.. Based on the observed information, it is clear that most of them had fewer land holdings than the average farm size [4]. Recorded the same result for small farmer’s food security programs.

The majority of respondents (69.2%) reported a medium yearly family income, while 20.8% and 10% reported low and high annual family incomes, respectively. The results indicate the existing status of marginal farmers, with the majority of respondents (90.00%) having low to moderate yearly family incomes. According to information in Table 1, the majority of marginal farmers (95.8%) received low credit, 3.4% received medium credit, and 0.8% received high credit. From 1 to 10 hours per day were allotted to farm work by the marginal farmers. The daily average for hours spent working on farms was 6.85, and the standard deviation was 2.48 (Table 1). According to the observed data, the majority of marginal farmers (63.3%) worked longer than six hours each day on the farm, while

29.2 and 7.5% of them set aside medium and shorter amounts of time, respectively. With an average of 44.78% and a standard deviation of 17.97%, Table 2 showed that the observed range of contribution ranged from 10.03 to 96.45%. In terms of their farming businesses' contributions to household food security, more over half of the marginal farmers who responded (56.6%) received a medium level of support, while 26.7 and 16.7% received low and high levels of support, respectively.

As shown in Table 3, the overall contribution of marginal farmers' farming operations to household food security has been further divided into major agricultural enterprises.

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 [10,11,12]. Similar findings were made, according to which the agricultural sector provided the most assistance to small-scale farmers in achieving food security. More than 90% of the production in the livestock, fishing, and fruit industries was sold. Crops sold out far less quickly than other goods. Because the marginal farmers in the research region were unable to produce rice in accordance with their family's demands, rice is one of the crops that is rarely sold out. In order to buy rice, fish, meat, and other household requirements, the other farm products were primarily sold out.

3.2 Inferential Analysis

3.2.1 Relationships between independent and dependent variables

Age and Contribution of Farming Enterprises: The calculated "r" value was non-significant, and the correlation coefficient between the age of marginal farmers and the contribution of their farming enterprises to household food security was 0.118. So, it would be possible to accept the null hypothesis. Therefore, it might be concluded that the respondents' ages did not have a substantial impact on their ability to achieve family food security through their farming endeavors. In addition, age was adversely connected with credit obtained, cropping intensity, family size, and annual dietary requirements. While the latter had a beneficial effect, the former had a negative effect on how much farming operations contributed to family food security [4]. Recorded the similar observation.

Education and Contribution of Farming Enterprises: The association between marginal farmers' education and their farming operations and household food security was positively non-significant, with a r value of 0.016, according to Table 5. Therefore, the null hypothesis in question could be accepted. Conclusion: The respondents' ability to achieve household food security through their farming endeavors was unaffected by their level of education. Marginal farmers tended to be either illiterate or only have a rudimentary education.

Family Size and Contribution of Farming Enterprises: Based on the calculated "r" value, this correlation coefficient was -0.48 and was considered to be adversely significant. So, it was not possible to rule out the null hypothesis. It implies that the respondents' ability to achieve food security for their families through their farming endeavors was significantly influenced by the size of their families. Family size decreases as family requirements increase, whereas the number of family members increases the quantity of calories the family needs.

Farm Size and Contribution of Farming Enterprises: They have a 0.421 correlation coefficient, which is favorably significant. The null hypothesis in question could be disproved. It goes without saying that additional land area permits more farming enterprises of higher quality.

Annual Dietary Needs of Family and Contribution of Farming Enterprises: The -0.514 correlation coefficient indicates that there is a bad link between them. One may draw the conclusion that an essential criterion for determining the contribution of farming companies was the family of respondents' annual food demands. The nutritional requirements of a family have a clear linear link with food security.

Daily Time Allocation in Work and Contribution of Farming Enterprises: This correlation coefficient was 0.016, indicating a favorable correlation. It was determined that marginal farmers' daily time commitment to farming was not a significant factor in ensuring the security of their household's food supply.

Table 1. Descriptive statistics of the 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

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		

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

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%)

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*

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

Tables 6 and 7 show the problem severity for small farmers in achieving household food security as measured by the Problem Facing Index (PFI), as well as their ranking as determined by the PFI values. According to Table 6's statistics, with a mean of 15.07 and a standard deviation of 2.46, the majority of marginal farmers (97.5%) experienced challenges of the medium category in ensuring household food security. According to data in Table 7, the top issue was "inadequate land for farming," which was followed by "inadequate training facilities," which came in second, and "lack of contact with communication media," which came in third. The "non-cooperation of family members" issue was the least significant issue that marginal farmers had to deal with in order to achieve household food security [4]. Showed the similar result.

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 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

According to the study's findings, the majority of respondents (56.6%) fell into the medium group when it came to achieving household food security. Furthermore, just 55.22% of annual nutritional demands were met. In order to increase the contribution of farming operations to household food security, smaller families are preferred. Crops alone provided 41.70 percent toward achieving food security, followed by animals (2.15), fisheries (0.47), and fruits (0.46). There was a favorable correlation between farm size and annual family income and the contribution of farming operations to food security in the home. A bigger farm will produce a higher yearly income. Although the practiced cropping intensity had a negative correlation with the contribution of farming enterprises to household food security, if cropping intensity could be increased by marginal farmers with relatively larger farms, this could help to increase the level of contribution of farming enterprises. The majority of farmers encountered a moderate level of diverse issues when ensuring household food security. In conclusion, it can be said that the main obstacles small farmers faced in achieving household food security were a lack of suitable land for farming, a lack of training resources, a lack of access to the media, a lack of credit, and a lack of knowledge about the various facets of improved farming enterprises. These can be considered during making any plan to ensure the food security of marginal peasants.

COMPETING INTERESTS

The authors declare that they have no interests that may be seen as influencing the findings and/or discussion described in this work, according to the publisher's definition of a conflicting interest.

REFERENCES

1. Rahman M. Role of agriculture in Bangladesh economy: Uncovering the problems and challenges, International Journal of Business and Management Invention. 2017 Jul;6(7):36-46.
2. Masuku M, Selepe M, Ngcobo N. Small scale agriculture in enhancing household food security in rural areas, Journal of Human Ecology. 2017 Jun 3;58(3):153-61.
3. World Bank, Bangladesh: Growing the economy through advances in agriculture. World Bank, Washington DC; 2016. Available:https://www.worldbank.org/en/results/2016/10/07/bangladesh-growing-economy-through-advances-in-agriculture
4. Kobir H, Rahman MZ, Islam MS, Sultana N, Al-Musa MA. Contribution of farming enterprises of the small farmers towards household food security, Journal of Environmental Science and Natural Resources. 2012;5(2):323-8.
5. Meyer LH. Food Chemistry. USA: Litton Educational Publishing, Inc; 2004.

6. Kleiner S. Questions and Answers about Nutrition. Microsoft Encarta; 2006.
7. Akter T. Participation of Women in Income Generating Activities (IGA) of SUS. M.S. (Ag. Ext. Ed.) Thesis, Dept. of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh, Bangladesh; 2003.
8. Dulayapach P. Prospects for rural women's contribution to sustainable food security. InRole of rural women in food security in Asia and the Pacific. APO Seminar on Role of Rural Women in Food Security held in Thailand, 21-25 August 2000, Asian Productivity Organization (APO). 2002;55-63.
9. BBS. Statistical Yearbook of Bangladesh 2019. Bangladesh Bureau of Statistics, Ministry of Planning, Government of the People's Republic of Bangladesh, Bangladesh; Published: May 2020.
10. Edeoghon CO, Idowu AA. Role of agricultural enterprises in food security status of urban farmers in Ikorodu Metropolis, Lagos State, Nigeria. Ethiopian Journal of Environmental Studies and Management. 2017 May 18;10(3):404-14.
11. FAO. FAOSTAT Online Statistical Service. United Nations Food and Agriculture Organization (FAO), Rome. Available:http://faostat.fao.org (Accessed October 2007).
12. Semwanga AM. Challenges, constraints and local solutions to urban food security: A situation analysis of Kampala-Uganda. In Unpublished paper presented at the Regional Workshop on food security and Nutrition in Urban areas, University of Zimbabwe, Harare; 2000.

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