



Constraints Faced by the Small-Scale Farmers in Achieving Household Food Security: A Case from Dinajpur District, Bangladesh

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ARTICLE INFO

Article History

Received
15 July 2020

Received in revised form
12 September 2020

Accepted
16 September 2020

Available online
22 September 2020

KEYWORDS

Constraints, food security, small-scale farmers, Dinajpur

ABSTRACT

The main objective of the study was to determine the extent of constraints faced by the small-scale farmers in achieving household food security and their suggested solutions to overcome the constraints. The small-scale farmers of Mongolpur and Ranipukur union of Birol upazila under Dinajpur district were the respondents of the study. Data were collected by using a pre-tested structured interview schedule with a randomly selected sample of 125 farmers from a population of 1250 small-scale farmers. Personal interviewing was conducted during 15 September to 20 October 2019. Eighteen major constraints as faced by the small-scale farmers in achieving household food security were identified in the study. A four-point rating scale was used to measure the extent of constraints, and based on the scale score, the farmers were categorized. Moreover, Constraint Facing Index (CFI) was calculated to rank the selected constraints. Highest proportion of the farmers (63.2 percent) faced medium constraints in achieving household food security. Among the 18 selected constraints the highest constraints facing index (CFI) was found for 'attack of diseases and pests in crop field' which is 317 and the lowest was 'lack of co-operation from family members' with a score of 122. Most prioritized suggestions regarding the solution of constraints were 'alternative income generation' followed by 'arrangement of organized marketing system with reasonable price for the food items' and 'supply of quality seeds and other agricultural inputs in reasonable price'. Given the increasing recognition in nutrition policy and its importance, the wider consideration in national development strategies for farm extension services, and production inputs as well as produce marketing system for bringing dietary security are recommended.

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Introduction

Promoting the people's basic needs and well-being for making the world free from hunger is one of the greatest concerns of the Sustainable Development Goals as prescribed by United Nations. Malnutrition and poverty are the greatest challenge especially for the developing countries. The difficulty of food insecurity has been faced and given as the first priority in achieving the most fundamental human right in all developing countries (ADB, 2007). Although there was reducing undernourished people in some of the developing countries, the current global food crisis emerging from soaring prices of staples and depletion of food stocks affect the access to food by poor people in many developing countries (FAO, 2016). Bangladesh is one of the world's most densely populated countries with approximately 163 million people living within a relatively small landmass (FAO, 2016; World Bank, 2018a). Since 2016, the Bangladeshi economy has faced formidable challenges, including climate change that has been detrimental to agriculture, governance issues around the banking sector, and the influx of Rohingya refugees from Myanmar, of whom nearly 900,000 are now in Bangladesh (UNHRC, 2015; World Bank, 2018b). Food insecurity is a major obstacle the world faces today, and Bangladesh is not an exception. According to the 2018 Global Hunger Index (GHI) published jointly by Concern Worldwide and Welthungerhilfe, Bangladesh falls into the serious category scoring 26.1 which is considered as alarming. Bangladesh is ranked 86th out of 119 countries. As per the current report, undernourishment for the country's population is 15.2 percent and stunting of children under the age of five stands at 36.1 percent (Grebmer *et al.*, 2018). Beyond all the challenges, Bangladesh has yet to achieve comprehensive food security that resolves the problems of inadequate food intake and chronic malnutrition among poor people. Ensuring food security through ecologically sound and climate-resilient farming systems is extremely important as per present global situation.

The term smallholder or small-scale farmers refers to producers who farm in smallholdings. This term includes farmers growing in home-food gardens or homestead gardens, irrigated farmers and people farming in rain-fed fields outside of the homestead (Samkelisiwe *et al.*, 2020). Characteristics differentiating small-scale/smallholder from commercial farmers include scale and size of farm system, proportion of crops sold, household expenditure, and use of family labor, mechanization, capital intensity, financial ability and level of linkages with larger economic systems (Makate *et al.*, 2016). Besides all the short-comings, small-scale agriculture presents an opportunity to improve the livelihoods of the rural poor and ensure food security; however, many of the rural farmers, who had previously managed to successfully cultivate crops for subsistence use and to supplement their income, now experience poor yields or have ceased production. This can be attributed to increased urbanization, poor productivity and competition from commercial agriculture, which is producing food more effectively and at lower prices (Beynon *et al.*, 1998). It is, therefore, imperative that small-scale farmers face variety of constraints ahead of them and is expected to adopt new technologies to increase production and, consequently, ensure food security. Improved productivity of these small-scale farmers is the key to providing practical, sustainable solutions able to address the growing problem of food security on a global scale. Thus, it is necessary to have an account of the constraints faced by the small-scale farmers to formulate effective policies to overcome them for ensuring adequate food security. Therefore,

this study was undertaken to (i) determine the extent of constraints faced by the farmers in achieving household food security, and (ii) gather suggestions given by the farmers to overcome the constraints.

Methodology

The study was conducted in Birol upazila of Dinajpur district. It was selected purposively among the thirteen upazilas of the district. This upazila is well developed and well transport system exists with the district headquarter and capital city of the country as well as the researcher is well adjusted with the socio-cultural conditions of the upazila. That's why it was selected for the study purposively. Among twelve *unions* of Birol upazila, two *unions* namely Mongolpur and Ranipukur were randomly selected for the study. Among 1250 small-scale farmers in the two unions, 125 were randomly selected as sample by using simple random sampling method. Data were collected during 15 September to 20 October 2019 by using a structured interview schedule by face to face interview method. The collected data were coded, compiled, tabulated and analyzed for interpretation. Different descriptive statistical measures such as frequency, number, percentage, mean, standard deviation and rank order were used for categorization and describing the variables.

A constraint facing scale was constructed to measure the constraints faced by the small-scale farmers in achieving household food security by using closed form questions. Firstly, twenty-five constraint items of the constraints facing scale was prepared based on Agada and Igbokwe (2015), Dayo *et al.* (2008), Ijatuyi *et al.* (2017) and Joel *et al.* (2018). Out of these, eighteen most important constraints of the small-scale farmers of the study area were finalized in the scale based on pre-test experiences. The farmers were asked to give their opinion on 18 selected constraints which were identified by discussing with the farmers prior to data collection. A four-point rating scale was used for computing the constraint score of a respondent (Mahzabin, 2011). For each constraint, score of 3, 2, 1 and 0 was assigned to indicate the extent of constraint faced by the respondents as high, medium, low and not at all, respectively. The overall constraint facing score was computed for each of the respondent by summing their attained scores. The possible score of the Constraint Facing Index (CFI) for each of the respondent could range from 0 to 54, where 0 indicates no constraint facing and 54 indicates highest constraint facing. Based on the overall constraint facing scores the respondents were categories into three groups following the equal distribution of the possible range.

Again, the Constraint Facing Index (CFI) was computed using the following formula:

$$CFI = (C_h \times 3) + (C_m \times 2) + (C_l \times 1) + (C_n \times 0)$$

Where, CFI = Constraints Facing Index

C_h = Number of respondents mentioned the extent of facing the constraint as high

C_m = Number of respondents mentioned the extent of facing the constraint as medium

C_l = Number of respondents mentioned the extent of facing the constraint as low

C_n = Number of respondents mentioned the extent of facing the constraint as not at all

The CFI score for each of the constraints could range from 0 to 375, where 0 indicates the lowest extent of constraints and 375 indicates the highest extent of constraints faced by the farmers. Ranking of the constraints was done based on the CFI scores for of the constraints. Attempts were also made to find out the suggested solutions of the identified constraints using an open from question in the questionnaire. Ranking was done based on the number of citations for each of the suggestions by the respondents.

Results & Discussion

Constraints faced by the farmers in achieving household food security

The computed scores of the constraints faced by the farmers ranged from 15 to 46 with a mean of 33.34 and standard deviation of 6.77. Based on the observed scores, the distribution of the respondents has been presented in Table 1. The results presented in Table 1 reveal that the highest proportion of the farmers (63.2 percent) faced medium constraints, while 31.2 percent and 5.6 percent of them faced high and low constraints, respectively. Majority of the farmers in the selected area faced medium constraints in achieving household food security. Moreover, there is a legit number of farmers facing high constraints in the area. This reflects that there exists a good amount of constraints which could result in food insecurity in the selected area. More or less similar findings were found by Mahzabin (2011).

Table 1 Distribution of farmers according to the extent of constraints (N=125)

Categories	Number	Percent	Mean	Standard deviation
Low (up to 18)	7	5.6	33.34	6.77
Medium (19-36)	79	63.2		
High (>36)	39	31.2		
Total	125	100.0		

Rank order of the constraints faced by farmers in achieving household food security

For getting a better understanding about the severity of the selected constraints in achieving household food security status, it is necessary to conduct a comparative analysis of the constraints. For this purpose, the determination of the extent of constraints faced by the farmers in achieving household food security were identified as high, medium, low, and not at all and based on their responses, the constraint facing indices were calculated for 18 selected constraints. The extent of constraints faced by the farmers in achieving household food security considering the Constraint Facing Index (CFI) values along with their rank order have been presented in Table 2.

Table 2 Rank order of selected constraints faced by the farmers

Sl. No.	Constraints	Not at all	Low	Medium	High	CFI*	Rank Order
Economic							
1.	Lack of money or necessary fund	5	37	50	33	236	10 th
2.	Insufficient credit support	8	41	57	19	212	14 th
3.	High cost of production	8	12	33	72	294	3 rd
4.	High price of food items	3	10	30	82	316	2 nd
Social							
5.	Lack of co-operation from family members	53	36	22	14	122	18 th
6.	Rapid population growth	16	34	45	30	214	13 th
7.	Lack of employment	5	15	47	58	283	4 th
Natural							
8.	Crop damage due to natural calamities	5	31	47	42	251	5 th
9.	Attack of diseases and pests in crop field	3	11	27	84	317	1 th
10.	Declining soil fertility	4	35	47	39	246	6 th
Marketing of produce related							
11.	Lack of market access	16	53	31	25	190	16 th
12.	Not getting proper value of farm products	7	35	40	43	244	7 th
Input related							
13.	Inadequate land for farming	15	28	56	26	218	11 th
14.	Lack of irrigation water in dry season	19	46	35	25	191	15 th
15.	Unavailability of quality seed	11	34	32	48	242	8 th
Technological							
16.	Lack of storage/processing facilities	5	49	47	24	215	12 th
Information access							
17.	Lack of information related to food and nutrition	1	41	52	31	238	9 th
18.	Lack of contact with communication media	13	52	44	16	188	17 th

CFI*= Constraint Facing Index

Results of Table 2 indicated that ‘attack of diseases and pests in crop field’ (CFI 317) is found to be the major constraint faced by the farmers in achieving household food security. Plant pests and diseases affect food crops, causing significant losses to farmers and threatening food security (Sarmin, 2019). The spread of plant pests and diseases has

increased dramatically in recent years. Globalization, trade and climate change, as well as reduced resilience in production systems due to decades of agricultural intensification, have all played a part in this. Plant pests and diseases can easily spread to several countries and reach epidemic proportions. Outbreaks and upsurges can cause huge losses to crops and pastures, threatening the livelihoods of vulnerable farmers and the food and nutrition security of millions at a time (FAO, 2019). Expectedly, similar results and arguments were also presented by Ijatuyi *et al.* (2017). The second top ranked constraint faced by the farmers is ‘high price of food items’ (CFI 316). Rising food prices pose a serious threat to food security at both household and country level (Shahiduzzaman *et al.*, 2014). This can have a major and devastating effect in terms of food security. Rising food prices can have a devastating effect on the health of poor households by making it more difficult for them to afford basic food baskets (Mkhawani *et al.*, 2016). In the recent years, the food price has been rising consistently making it difficult for the less fortunate people in affording nutritious food. Thus, the farmers in the selected area are not an exception and expressed this problem with priority (Sarmin, 2019). However, it might be because of lack of proper marketing channels for the farming households which induce them to take less amount of food. This is a “situation of induced food insecurity status” which is most common phenomena in rural settings where there is no proper market for farm produce. This argument is in contrast with Ijatuyi *et al.* (2017) who proposed the situation of induced food security for the farm households. Third ranked constraint faced by the farmers is ‘high cost of production’ (CFI 294). The constant rise in the price of agricultural inputs like quality seeds, fertilizers, pesticides, farm machineries etc. all together have been increasing the total cost of crop production. To compensate the price hike, farmers are obliged to increase the price of the produce. As a consequence, this ultimately increases the food price making it unaffordable for the poor (Sarmin, 2019). Further, where studies have considered nutritional outcomes of agricultural input subsidy interventions thus reduce the production cost, this has often been in regard to changes in consumption of the targeted staple food, measured in terms of calorie consumption or a similar measure of changes in energy availability, ignoring other aspects of malnutrition, including impacts from dietary diversity (Walls *et al.*, 2018). The fourth ranked constraint faced by the farmers was ‘lack of employment’ (CFI 283). Unemployment is positively related to the probability of food insecurity. Multiple episodes of unemployment (i.e. transitions between employment and unemployment) not only increase the amount of time in unemployment, but also impose additional risk of food insecurity (Huang *et al.*, 2015). During lean period farmers usually remain idle and they do not have opportunities to utilize their labor, and possibly that is why lack of employment have emerged as an important constraint (Shahiduzzaman *et al.*, 2014, Mahzabin, 2011). The fifth ranked constraint faced by the farmers was ‘crop damage due to natural calamities’ (CFI 251). Disasters can occur in isolation, in triggered consecutiveness or in simultaneous combination, with mutually magnifying effects. Such emergencies pose serious challenges to agricultural production and food security (FAO, 2017). The farmers face flood which affects their crops miserably which directly affect their level of food security (Sarmin, 2019).

Suggested solutions to overcome the constraints

Suggestions as offered by the farmers to overcome their constraints in bringing household food security were identified and ranked which are given in Table 3.

Table 3 Rank order of suggested solutions to overcome the constraints

Suggested solutions	Frequencies	Rank order
Creating alternative income generating activities during the lean period as farmers usually remain idle and do not have the opportunity to earn enough money to satisfy their basic needs.	76	1 st
Arrangement of organized marketing system with reasonable price for the food items	68	2 nd
Supply of quality seeds and other agricultural inputs in reasonable price	52	3 rd
Providing credit at low interest rate in easy terms and condition so that farmers could have easy credit access to bear high cost of production	45	4 th
Maintaining plant quarantine strictly so that severe attack of diversified pest and diseases can be prevented and controlled	20	5 th
Timely and demand led advice by the extension personnel at farmers doorstep	15	6 th

Results in Table 3 indicates that the farmers demanded alternative income generation during the lean period so that they do not remain idle and have enough money for purchasing food. Similar suggestion also found in the study of Shahiduzzaman *et al.* (2014). Moreover, farmers demanded well-organized marketing system so that price of the food items remains in their reach. In addition, they demanded supply of quality inputs so that production of crop remains as expected and credit support at favorable terms and condition so that they can produce sufficient outputs meeting their basic needs. At some extent they demanded strict plant quarantine system so that crops don't get damaged due to attack of transboundary pest and diseases and a well-organized extension system to have proper information support as and when needed.

Conclusion

The study concludes that majority of the farmers had faced medium constraints in achieving household food security. But there remains a legit percentage of farmers facing high constraints which is engraving the food insecurity condition. Moreover, 'attack of diseases and pests in crop field', 'high price of food items' and 'High cost of production' were the top ranked constraints. The constraints are needed to be solved to ensure the food security and well-being of the farm households especially the over-dominating small-scale farms. Both GOs and NGOs can promote year-round income generating activities (IGAs) along with different off-farm endeavors as suggested by the farmers. This might give farmers support in

satisfying their unfulfilled needs and achieving food security. NGOs can emphasize on uplifting the socio-economic condition of their beneficiaries through alternative income generation, providing incentives, arranging training, giving credit in easy terms and conditions etc. Arrangement of adult literacy programs emphasizing skill development and capacity building needs to be undertaken by both government and non-government organizations so that farmers are capable enough to contribute to household food security. Moreover, the linkage between GOs and NGOs with farmers is needed to be strengthened to make available the required inputs, technologies and information's for agriculture and proper steps to mitigate the constraints faced by farmers in achieving household food security. In addition, assurance by the government for adequate arrangements of credit facilities for willing farmers should be provided, together with a regular distribution of farming incentives to farmers at regulated prices. There is also a need to provide adequate education to facilitate the farmers' receptivity to new innovations. Since the small-scale farmers suffer from constraints/shocks regarding information of farm production and marketing system, the government should emphasize wider consideration on information of farm production, inputs and produce marketing system which impacts on dietary security. The government should also provide a holistic approach to the discrepancy in the national and grass-roots food security status, so as to affect a timely intervention in order to rescue the most vulnerable farmers who operate small-scale farms. For strong evidence base and review focused on the impact of agricultural input subsidies and marketing system on food security and nutrition, further study needs to be focused.

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