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Gender Role on Food Security and Consumption Practices in Bangladesh

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Authors' contributions

This work was carried out in collaboration among all authors. Author MHR designed the study, collect the primary data and performed the statistical analysis, wrote the protocol. Author MSK supervised the student to complete the study, Authors MHR, MSK and MMI managed the analyses of the study.

Authors MPM and ASA and MMI managed the literature searches and wrote the first draft of the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

This study was carried out to investigate the factors affecting food security status, patterns of food consumption, and changes in consumption behavior. It also evaluated the gender role in food security and consumption practices in the rural areas of Bangladesh. The research was both in quantitative and qualitative in nature. Qualitative research tools such as FGD, KII and Case Study were used to collect the primary data. Data analysis was done by Microsoft Excel and SPSS. Binary Logistic regression model was used to determine the factors affecting in food security status of the selected households. Regression result shows that income, availability of food and food stock were found to be positive and size of household negatively associated with the food security. Rice dominates the food consumption pattern of the rural people. Income, production, education

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and awareness are causes of change in consumption behaviour of the people of study area. Men have pivotal role in household food security. Male members involve in income, assure of family assets, and on the contrary female have to manage almost all the unproductive household affairs. In the poorer household women have a little contribution in food security due to male dominating. Women contributions were more than that of men in household food consumption. Most of the household related tasks and household works related to food consumption were done by female.

Keywords: *Gender role; food security; consumption practices; rural Bangladesh.*

1. INTRODUCTION

Among the most natural disaster-prone countries including floods, cyclones, and droughts, Bangladesh is in the fifth position [1]. In recent years, food security is a burning and global issue. It is much more difficult to ensure the food security due to the rising world population, affecting food production by climate challenges and a focus on market-based solutions that undermine livelihood production in vulnerable rural areas. Particularly, Asian countries are more affected where poverty, hunger and malnourishment affect a significant proportion of population [2]. Bangladesh is an agro-based country, most of the people especially the rural people in Bangladesh are engaged in agriculture and it is the main subsistence option of the rural poor [3]. Still now, Bangladesh has to import great amount of food grain in some cases from other countries.

Perceptions and attitudes towards consumption vary from man to man and are linked with many other economic and social issues [4, 5]. Consumption patterns are changed for the reasons of both micro and macro-level changes. The "food system" in Bangladesh is rapidly changing [6]. There is a direct link between utilization of dimension of food security and women's role in the households. Most of the households as nearly 80% of households found as mainly women prepare the household meals. There is a positive correlation between the women's education & their intention of preparing a nutritious diet and the diversity of the diet consumed by the household members [7, 8].

It is hard enough to find alternative income sources for the low asset households [9]. Traditionally, men are the workers and women are the homemakers who mainly cook and look after others household's matters as well as men are biologically stronger, bigger, and taller almost all the time compared to the women. There is less opportunity to learn the cooking trades since

men are traditionally the main earning person in a household. So, women offer more food towards men and they take less [10].

Bangladesh has attained remarkable progress in women empowerment and to keep household's food secure. More than 50% of rural households, women are working or doing business such as homestead farming, raising poultry and livestock and doing household works in rural Bangladesh. But still now rural women are facing many socioeconomic challenges [11]. Generally, women are sacrificed their choice and make meal by the direction her husband. In the time of natural disasters such as flood, cyclone, famine or uneven situation of the family, women are sacrificed their meal for her family. In the poorer household, women are commonly seen to sacrifice their own meal for their husband and children.

In the line of previous study findings, present study intended to investigate the pattern of food consumption, change in consumption behavior, factors affecting food security status of the selected household. The main focus of the present study is to identify gender role in consumption behavior and food security status of rural household. There is no such research considering rural areas and women in food security context. This research can help policy makers and development workers to develop more appropriate projects and programs in terms of food security and consumption matter.

2. METHODOLOGY

For the purpose of the present study, three villages of Madhupur Upazilla in Tangail district were selected by purposive sampling. Considering the objectives, three villages under Madhupur Upazila named Jatabari Purbo Para, Pirojpur and Kakraidi were selected purposively. Considering the above mentioned aspects, a sample size of 60 households was chosen randomly for the present study. Both male and female were interviewed as respondents from the

selected households and a total of 60 respondents were interviewed in which 34 were male and 26 were female respondents. Most of the respondents are mainly involved the small business, farming, day laborer, and housewife.

2.1 Data Collection

The interview schedule was prepared in order to collect necessary information to fulfill the objectives of the study. Participatory Rural Appraisal (PRA) tools such as Focus Group Discussion (FGD), Key Informant Interview (KII) and Case Study were used for the collection of primary data. Primary data were also collected through a sample survey with the help of semi-structured interview schedule. The data were collected in the month of February and March 2018 through several visits to the study areas. Participant of the Case Study and KII were selected through snowball sampling technique. FGDs were conducted by the researcher along with the help of other local members. Total 60 respondents were interviewed for gathering detailed information. The main sources of secondary data were previous studies, scientific papers, BBS, journals, research reports, books, newspapers, different officials, government and non-government institutions and various website related to the study.

2.2 Analytical Technique

After completion of data entry data were classified, tabulated and analyzed to accomplish the specific objectives of the study. Various descriptive and inferential statistical techniques, such as percentage, Chi-square test, cross-tabulation, Binary logistic model, etc. were adopted for getting meaningful results. All the statistical analyses were performed by using Microsoft Excel and Statistical Package for Social Sciences (SPSS) with latest version. Some mathematical and statistical techniques were also used in the study.

2.3 Binary Logistic Model

In the present study, the following Binary Logistic model [12] was used to identify the factors affecting in food security status of the select household.

$$Y_i = I_n[P_i \div (1 - P_i)] = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + U_i$$

Where, P_i is the probability of food secured, $P_i = 1$ indicates food secured; $P_i = 0$ indicates food insecure.

Dependent Variable:

Y_i = Probability of food secured

Independent Variables:

X_1 = Size of household (number of members)
 X_2 = Education of the respondent (years of schooling)
 X_3 = Household Income (TK/per month)
 X_4 = Expenditure on food (TK/per month) X_5 = Availability of food
 X_6 = Accessibility to food (If yes=1, no)
 X_7 = Food stock (If yes=1, no =0)
 X_8 = Food stock in uncertain situation (If yes= =0)
 U_i = Error term
 β_0 = intercept and $\beta_1, \beta_2, \beta_3, \dots, \beta_{11}$ are the coefficient

Odds Ratio:

An odd is the ratio of the probability of occurrence of an event to that of non-occurrence.

An odds ratio is a measure of association between a factor and outcome.

When Odds ratio (OR),

OR=1, factor does not affect odds of an outcome
 OR>1, factor associated with higher odds of an outcome and, OR<1, factor associated with lower odds of an outcome.

3. RESULTS AND DISCUSSION

3.1 Factors Affecting Food Security Status of the Selected Household

Food is a basic human need for human survival. Food security is a critical global issue. Although Bangladesh has achieved sufficiency in food production but food security is remaining a challenge in rural areas of the country. Ensuring food security would continue to be a major challenge for Bangladesh in coming years. There are many factors which affect food security. The data were analyzed by econometric analysis (Binary Logistic regression model) to describe the factors that affect food security status of the selected household. The dependent variable was food security and independent variables are education, size of the household, income, expenditure on food, accessibility to food, availability of food, food stock, and food stock in uncertain situation. These variables were used in different combinations to identify the best fit

equation in each case based on a set of hypothesis in relation to the effect of the variables on the food security status of the selected household.

The Logistic regression results are shown in the Table 1 that the variables in the equation along with an associated p-value. In this model four independent variables out of eight were found significant in explaining the variation in household food security. These variables are size of household, household income, availability of food and food stock.

Size of Household (X₁): Odd ratio of household size coefficient is 0.909 refers to, holding other variables as a fixed value, the probability of household food security will decrease by 9.1% as household size increases by one unit. There is a negative relationship between the household food security and size of household.

Education of the Respondent (X₂): Odd ratio of education coefficient was 1.002 indicates that, holding other variables as a fixed value, the probability of household food security will increase by 0.2% as years of schooling increases by one year. This implies that education has less significant impact on household food security.

Household Income(X₃): Odd ratio of income coefficient was 1.230 indicates that, holding other variables as a fixed value, the probability of household food security will increase by 23% as one thousand taka increase in income. There is a positive relationship between the household food security and household income.

Expenditure on Food(X₄): Odd ratio of expenditure on food coefficient was 0.586 refers that, holding other variables as a fixed value, the

probability of household food security will decrease by 41.4% as one thousand taka increase expenditure on food. This implies that the expenditure on food has less significant impact on household food security.

Availability of Food(X₅): Odd ratio of availability of food coefficient was 1.868 indicates that, holding other variables as a fixed value, the probability of household food security will increase by 86.8% as availability of food increases by one unit. There is a positive relationship between the household food security and availability of food.

Accessibility to Food(X₆): Odd ratio of accessibility to food coefficient was 0.790 refers that, holding other variables as a fixed value, the probability of household food security will decrease by 21% as accessibility to food increases by one unit. This implies that the accessibility to food has less significant impact on household food security.

Food Stock(X₇): Odd ratio of food stock coefficient was 1.891 indicates that, holding other variables as a fixed value, the probability of household food security will increase by 89.1% as food stock increases by one unit. There is a positive relationship between the household food security and food stock.

Food Stock in Uncertain Situation(X₈): Odd ratio of food stock in uncertain situation coefficient was 1.836 indicates that, holding other variables as a fixed value, the probability of household food security will increase by 83.6% as food stock in uncertain situation increases by one unit. This implies that the food stock in uncertain situation has less significant impact on household food security.

Table 1. Binary logistic regression analysis output

Variables	B	S.E	Wald	Df	Sig.	Exp(B)
Size of household (X ₁)	-.096	.035	3.092	1	.032*	.909
Education of the respondent (X ₂)	.641	1.297	.711	1	.675	1.002
Household income(X ₃)	.032	.012	2.899	1	.010*	1.230
Expenditure on food (X ₄)	-.053	.078	.456	1	.435	.586
Availability to food (X ₅)	.720	.239	3.763	1	.061**	1.868
Accessibility to food (X ₆)	-.271	.149	2.084	1	.310	.790
Food stock (X ₇)	.268	.117	2.543	1	.027*	1.891
Food stock in uncertain situation (X ₈)	.630	.465	1.833	1	.172	1.836

(* and ** indicates 5% and 10% level of significance)

From the estimated econometric model, it can be concluded that, several factors that affect food security at the household level. These factors are household size, household income, availability of food and food stock. Among these factors household income, availability of food and food stock positively effect on food security of the selected household. Size of household has negative impact on household food security. Education, expenditure on food, accessibility to food and food stock in uncertain situation were found to be less significant impact on household food security.

3.2 Food Consumption Practices and Behaviour

3.2.1 Consumption pattern

Food is essential for human survival and consumption of adequate food is vital to lead a healthy life. Food preference is quite different among the households. In rural areas of Bangladesh, the lack of proper nutritional knowledge people are failed to consumed nutritious food. This study found that, people usually consume three meals in day- rice with vegetables, fish, meat, egg, milk, and pulses. This study reveals that 100% of the households take rice as major meal. Wheat consumption is less in this study area. There only handful of households take wheat at times.

From the Fig. 1 daily average rice consumption of each household is 1749.412 gram. Rice is the staple food of our country, where rice dominates the food consumption pattern of rural people. Daily average wheat consumption is 68.003 gram. Where wheat can be an alternative of rice, there consumption of wheat is trivial. Due to the lack of education they don't know the food value of wheat. From Fig. 1 daily average household's meat, fish, milk, egg (piece), pulses, vegetables, fruits, oil, spices and salt consumption is 230.691 gm, 310.313 gm, 111.598 gm, 1.551, 92.312 gm, 732.418 gm, 152.343 gm, 107.728 gm, 212.211 gm and 85.346 gm respectively.

KII findings also reached similar outcome. The statement is mentioned below:

"Rice is the staple food. Here almost all of the families take rice thrice daily with vegetables, meat, fish, egg, pulses etc. They don't have enough knowledge about the nutritional content of different foods. They are ignorant about the food value of wheat either (KII Participant)."

3.2.2 Consumption expenditure

The household food expenditures in our country have received considerable attention in recent years because of the fast economic growth and increasing knowledge about food consumption. Expenditure on food is increasing along with the increment of income.

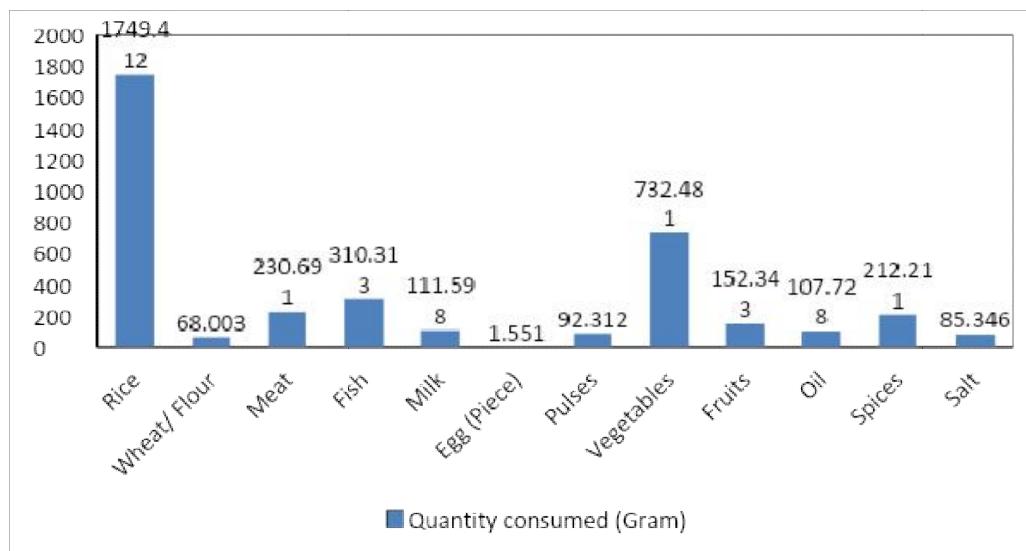


Fig. 1. Daily average food consumption of selected household

Source: Sample Survey, 2018

Table 2. Average monthly household nominal income, expenditure and consumption in Bangladesh

Survey Year	Residence	Income (Tk)	Expenditure (Tk)	Consumption (Tk)
2010	National	11479	11200	11003
	Rural	9648	9612	9436
	Urban	16475	15531	15276
2005	National	7203	6134	5964
	Rural	6095	5319	5165
	Urban	10464	8533	8315
2000	National	5842	4881	4537
	Rural	4816	4257	3879
	Urban	9878	7337	7125

Source: BBS, 2003, 2007, and 2012

Table 3. Monthly average household income and expenditure on food in selected Household

Village	Sample Size	Income (Tk)	Expenditure on food (Tk)
Jatabari	23	13826.09	5113.043
Pirojpur	17	13029.41	5364.706
Kakrajd	20	13025	5540
Total	60	13333.33	5326.667

Source: Sample Survey, 2018

Table 2 shows that income, expenditure and consumption is higher in national level and urban area than that of rural area. Average consumption is increasing along with the increases in income.

Table 3 shows that monthly average household income and expenditure on food is Tk.13333.33 and Tk. 5326.667 respectively. Monthly average household income in Jatabari, Pirojpur and Kakrajd is Tk. 13826.09, Tk. 13029.41 and Tk. 13025 respectively and monthly average expenditure on food in Jatabari, Pirojpur and Kakrajd is Tk. 5113.043, Tk. 5364.706 and Tk. 5540 respectively. Although monthly average household income in Kakrajd is less than that of Jatabari and Pirojpur but expenditure on food is higher. Monthly average household income in Jatabari is higher but expenditure on food is less than that of Pirojpur and Kakrajd.

3.3 Gender Role on Household Food Security and Consumption Practices

Both male and female member of the household has significant contribution in food security and consumption practices. Generally male has great contribution in food security than female. But in household consumption behaviour female play an inevitable role. In Bangladesh, gender inequalities, patriarchal ideology, and men's

greater control over resources influence the intra-household distribution of power and benefits, affecting women's capability to feed their families. In the rural areas of Bangladesh, women's access to new information and technologies has been limited by their low literacy rate, social limitations, time-consuming household work, lack of skills training, and scarce employment opportunities. This leads to adverse effect on the women's decision-making process in the household. Gender inequalities have impact on food security and nutritional status of the household.

3.3.1 Income in relation to food security

Household food security is directly linked with the income. Income of a person plays an important role in shaping the economic conditions of an individual. In rural Bangladesh, most of the family head were men. In this study, the samples I have selected their household head are men. Men are exclusively contributed to the household income.

Table 4 shows that monthly average income of the husband or household head, wife and children Tk. 10433.33, Tk. 200 and Tk. 2700 respectively. This table also shows that maximum monthly average income of the husband or household head, wife and children Tk. 30000, Tk. 4000 and Tk. 27000 respectively.

Table 4. Distribution of household income

	Income of Husband (Tk/Month)	Income of Wife (Tk/Month)	Income of children (Tk/Month)
Mean	10433.33	200	2700
Range	30000	4000	27000
Minimum	0	0	0
Maximum	30000	4000	27000
Sum	626000	12000	162000

Source: Sample Survey, 2018

Notably, here all the earning children are male. The table reveals that almost all of the household income is contributed by male members.

"We are lagged behind in terms of facilities comparing to male. We have lots of social barriers which don't allow us to take education, decision making in household, awareness, health service and different income generating activities (FGD Participant)."

Our socio cultural system of the society doesn't allow women to go outside of the home. They do all the household activities. Men are head and main income generating person of the household in rural areas of Bangladesh.

"In the poorer households, women are engaging different income generating activities like as homestead gardening, rearing livestock and poultry beside household works. In the time of natural disaster women sacrifice their meals for their husband and children. In the time of

insolvency or ailing of the household head they support the family (KII Participant)."

In the study area women have little contribution in household income. In the poorer household, women also have contribution to household food security beside men which is unsung.

3.3.2 Occupational status of the selected household

Most of the rural people involved in farming, petty business whereas women are housewife.

Fig. 2 shows that all the women are housewife. Notably, from the selected 60 households, only in 6 household's women have a little contributing to family income. Men do work in the field and make money whereas women manage all the household affairs. Men play a vital role in generating household income as well as food security because all other family members have to depend on his income.

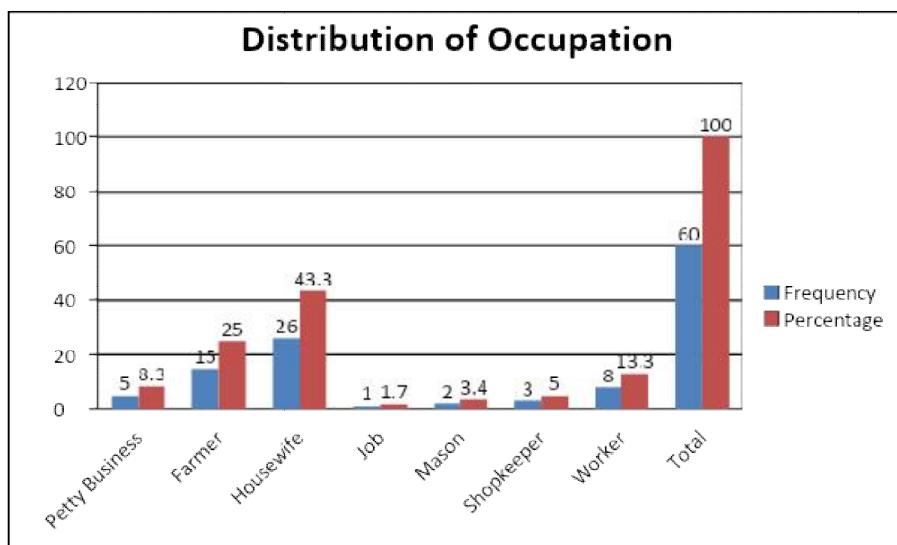


Fig. 2. Distribution of occupation

Source: Sample Survey, 2018

3.3.3 Gender role in food consumption practices

Unpaid domestic work is regarded as women's work. Though it is vital work, it is invisible work, unpaid, undervalued and unrecognised. Yet, the women's contribution to household in this regard is enormous. Work in the household is often considered to be part of a woman's duties as wife and mother. Preparation of food is exclusively done by women. Women have pivotal role in household food consumption practices compering with men.

3.3.4 Food purchase decision

Traditionally, food and grocery purchasing is a part of women decisions, but a change in roles are seen in every household. In the male dominating sociocultural pattern of our society, men also take part in household food purchase decision.

Key Informant Interview (KII) also indicating the same outcome which is mentioned below. *"Generally men earn money and women perform all the household works. In the food purchasing decision of household women contributes more because men never cook food. In most of the time women decide what items are to cook. That is why, in food purchasing decision women contribution is larger (KII Participant)."*

3.3.5 Food preparation decision

Basically, food preparation decision is a female's household related work. Male also participate in this decision making because male were household head. Sometimes male have made decision which food is to be prepared. In most of the cases female have made which food is to be prepared.

"We the females cook food. We know it better than male, what food staff we need to prepare meal. We tell them to bring staffs from market and transform these to an edible form (FGD Participant)."

3.3.6 Household related works

Traditionally, males are responsible for family income, safeguard of family assets, making all the major decisions in the family, on the other hand female do manage all the household affairs, take care of the family members. In this part, it is tried to unroll the spending hours both by male and female in household works like childrearing, cleaning houses, washing clothes. To find these, every respondent's spending hours on weekly basis were measured. Spending hours in household works by male and female are shown in the Table 5.

The result shows that, female spent more time than that of male in household related works. Male have a little participation in child rearing and looking after sick member of the family. Otherwise, rest of the household works is exclusively done by female.

3.3.7 Household works related to food preparation

Basically, male collect food staffs from market and female bring it up to edible form. In this part, it is tried to find out the spending hours both by male and female in household works related to food consumption like preparation of food, collection of food staff from market, collection of water and collection of fuel. To find these, every respondent's spending hours on weekly basis were measured. Spending hours in household works by male and female are shown in the Table 6.

From the Table 6, it is seen that food preparation and collection of water are completely done by female. In case of collection of food staffs, female have no participation due to our social structure. Female spend more time than that of male in collection of fuel. Finally we can say that, female spend more hours than that of male in household works related to food consumption.

Table 5. Average spending hours in household related works in a week

Works type	Spending hours		
	Male	Female	Total
Rearing children (feeding, bathing etc.)	1.44	20.01	21.54
Looking after sick member of the family	0.708	2.275	2.98
Cleaning houses	0	6.82	6.82
Preparing the children for school	0	7.06	7.06
Washing clothes	0	2.82	2.82

Source: Sample Survey, 2018

Table 6. Average spending hours in household works related to food preparation in a week

Works type	Spending hours		
	Male	Female	Total
Preparation of food	0	24.858	24.858
Collection of food staff from market	3.525	0	3.525
Collection of water	0	3.8	3.8
Collection of fuel	2.217	2.85	5.067

Source: Sample Survey, 2018

4. CONCLUSIONS AND RECOMMENDATIONS

Household income, availability of food and food stock influenced positively and size of household negatively in the food security status of the selected household. Food consumption pattern of the selected household was observed. Rice dominates the food consumption pattern of rural people. Food consumption behavior of the selected household was observed. Income, production, education and awareness had an effect on consumption behavior of people of the study area. People were spending more money on consumption than previous. Men were the main income generating person in every household. They were the safeguard of family assets and women did manage all the household chores. Men contributed more in household food security. Women contribution was more than that of men in household food consumption.

The collected data might not be fully realistic as the respondents provided data from their experience. It was difficult for the respondents to quantify the food items they consume. Due to the inadequacy of time and money as well as the social barriers it was not possible to have a close observation over gender role, which was necessary to get more valid and realistic outcomes.

Based on the outcomes, the following recommendations can be generated; Government should involve female in different income generating activities along with male to contribute in household food security as well as run special program for the food insecure people of the rural area. Education, health and training facilities should be promoted in the rural area so that poor households and their next generation can be benefited from these facilities. Awareness should be created among both male and female about healthy-nutritious food and balanced diet through different awareness creating programs. Enhance gender equality and equity through the training of more women in the study area.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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