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ABSTRACT

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Rural women play a key role in small ruminant (sheep and goat) production. The present study was carried out at Chattogram district of Bangladesh to investigate the role of women in household income through small ruminant rearing. Purposive sampling technique was used to select two upazilas from Chattogram district and three villages from each upazila based on density of small ruminant population. A total of sixty respondents (where 30 from each upazila) were selected following random sampling method. Data were collected from the respondents using structured questionnaire. Descriptive statistics and multiple log linear regression model was used to analyze the data. The results showed that highest proportion (28%) of women were in 45-54 age group and nearly half (46%) of the respondents were primary educated. The results revealed that average family size and farm size of respondents were 5.07 number and 0.27 acre, respectively. About 52% women earned BDT 12000-21000 per annum through small ruminant rearing. The results also indicates that income from sheep and goat, family size and farm size have positive and significant effect ($P < 0.01$) on household income. Experience has also positive and significant relationship ($P < 0.05$) with household income. The coefficient of determination (R^2) was 0.561 implies that about 56 percent of the variation of household income was explained by the set of explanatory variables in the model. Women faced some constraints, such as diseases, problem of thief, lack of capital, lack of land, high feed cost, lack of space, lack of training, lack of good variety, market price fluctuation and distance of market for small ruminant rearing. If proper environment and facilities can be ensured, women would contribute more to their family as well as the national economy.

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1. INTRODUCTION

In Bangladesh, about half of the total population (49.42 %) is female (World Bank, 2020) and a majority of them (62.6%) live in rural areas (World Bank, 2020a). But rural women have little opportunity to participate in intra-

household, socio-economic and decision-making processes as well as very limited interaction with people outside of the home (Parveen, 2005; World Bank, 2005; Quisumng and Mcclafferty, 2006; Orso, 2016). In a family, men seems to be the fundamental assets while women are often treated as a burdens. Women directly or

indirectly suffer discrimination within the household due to gender imbalance, their limited access to resources, scarce income-earning opportunities and lower education level (Nawaz, 2009). DFID (2000) stated that poverty reduction and upholding human rights can be implemented by ensuring women income in a family. Various income generating activities (IGAs) change the livelihood of the poor women in terms of housing, nutrition, health, sanitation, treatment and education (Ullah and Routray, 2007). In addition, eliminating the distressed condition and achieving a sustainable livelihood of rural women, they need to be involved in income activities much more actively. Currently, in Bangladesh, apart from government initiatives, a large number of non-government organizations are operating in rural areas, concentrating on rural women to change their livelihood (Sheheli, 2012). At present, women participate in different income generating activities like crop production, small ruminant rearing, cattle and poultry production, aquaculture etc. and play a significant role to enhance household income as well as management of their families (ADB, 2007; Al-Amin, 2008; Hoque and Itohara, 2009). The participation of women in income generation and domestic tasks are varied by region, religion, and class (Zezza, 2007). It is expected that the participation of women in sheep and goat rearing activities can contribute to enabling households to cope with income shocks, to ensure food security, to avoid an increase in poverty or to prevent vulnerable households from falling below the poverty line. Moreover, small ruminant (sheep and goat) requires little investment, less management, small space and low feed cost. So it is easy way to rural women to earn income by small ruminant rearing. Women's income is important for achieving economic growth and sustainable development in Bangladesh. Therefore, women economic contributions should be given importance in policy design (Kabeer, 2003). The null hypothesis of this study is that women have no contribution on household income generation activity. Role of women in household income by small ruminant rearing is a new concept in Bangladesh. Therefore, the current study focuses on socioeconomic characteristics of women, to assess their contribution on household income through small ruminant rearing and identify the constraints of small ruminant production in Chattogram district in Bangladesh.

2. MATERIALS AND METHOD

The study was conducted in six different villages namely (Sambol, Chanua and Shekerkhil from Banshkhali upazila) and (Chakrashala, Kachuai and Maddom para from Patiya upazila) of Chattogram district in Bangladesh. According to Wikipedia (The free Encyclopedia) Banshkhali Upazila is located at 22.05°N 91.94°E and Patiya is located at 22.3000°N 91.9833°E (Figure 1) in Bangladesh. Banshkhali has 55,609 households and a total area of 376.9 km² while Patiya has 70,218 households and a total area of 316.47 km². The areas were purposively selected based on density of small ruminant (SR) population. Data were collected from 60 women small ruminant rearers where 30 sample from Banshkhali and 30 from Patiya upazilla following random sampling method during the period from July to December, 2019 through direct interviews using a structured questionnaire (Table 1). In each village, a list of households, used as primary sampling frame, was obtained from the respective local district assemblies like Department of Livestock Services (DLS), and agricultural offices. Subsequently a random sample of 60 (10 per village) households was drawn. The information supplied by the women was recorded in the questionnaire. Both qualitative and quantitative data were collected using household survey method.

Analytical techniques

After data collection, the questionnaire was checked for completeness, cleaned, organized, coded and then entered into MS-Excel and STATA (Stata 14, Stata Statistical Software, Stata Corporation, College Station, Texas 77845 USA) for analysis. Both the descriptive and econometric methods were used to achieve the objective.



Figure 1: Chattogram district map

Table 1: Study areas and sample size

District	Upazila	Village	Total Sample
Chattogram	Patiya	Chakrashala	10
		Kachuai	10
		Maddom para	10
	Banshkhali	Sambol	10
		Chanua	10
		Shekerkhil	10
		Total	60

Income of women was defined as the total earning of respondent from small ruminant rearing during a year. Monthly family income was defined as the total earning of the respondent family from agriculture, livestock (cattle/buffalo, poultry/duck, sheep/goat) and non-agricultural sources (e.g., selling labour, service, business, remittance etc) during a month. Multiple log linear regression model was used to analyze data. The multiple regression model was as specified below:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + U_i$$

The multiple log linear regression model was as follows:

$$\ln Y = \ln a + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + b_7 \ln X_7 + U_i$$

Where, Y=Household income (Tk. /year);

X₁= Income from sheep & goat (Tk.

/year);

X₂= Age (years);

X₃= Education (Dummy; 1=Illiterate,

2=Primary, 3=Secondary, 4=SSC, 5=HSC and above);

X₄= Family size (No.);

X₅= Farm size (Decimal); X₆= Experience (years);

X₇=Access to Credit (Dummy; 1=No, Yes=2);

a= constant, b₁-b₇= Regression coefficient; ln= Natural logarithm; U_i=Error term.

3. RESULTS AND DISCUSSION

Socioeconomic profile of the respondents

It was observed that, highest proportion (28%) of the respondents were in 45-54 age group and in second portion (27%) were 26-34 age group in the study areas. Ayoade et al. (2009) found that majority (57%) of the respondents were in the age bracket 0 to 31-40 years. Table 1 also showed that 46% of the respondents in the study

areas were primary educated followed by illiterate (22%) and secondary educated (20%). Educated women could have positive influence on small ruminant production as well as contribute household income.

Data on occupation indicated that a greater proportion (83%) of the respondents who are full time housewives also engaged in raising of sheep and goat. Training experience was an important factor which enhanced the level of knowledge and improves skills on various aspects of agricultural technologies. Major proportion (88%) of women had no experience of any training about SR (sheep and goat) rearing. The SR (Small ruminant) farmers were not aware about various training courses offered by different organization. They gained idea about SR production from their neighbors, relatives etc. It is seen from Table 1 that the average family size was 5.07 which is similar with Roy et al. (2017). The family size was higher than national average (4.4 persons) (BBS, 2019). Moreover average farm size was 0.27 acre in the study areas which was lower than national average (1.68 acres) (BBS, 2016).

Dependency ratio was 26.53 which means that about 27% of total family members of the respondents are non-working age (age, below 14 and above 65) compared with the number of those working age (73%). Table 2 also shows that about 52% women earned BDT 12000-21000 yearly through small ruminant rearing. So we can say that women small ruminant rearer in the study areas are mostly low economic base. This finding agree with that of Dan and Kim (2020) who found about 47% of the women involved in raising animals earned between BDT 26516.76 – BDT79550.40 yearly.

Supporting family members of women rearer

Sheep and goat require minimum management practices. Women can easily efforts to small ruminant (SR) production. However women get support from their family member for SR production and management. Figure 2 shows that women get maximum support from their husband (43%) in the study areas. The results of this study were not similar with Afrin et al. (2008) reported that rural women very seldom get support from their husbands. In second position of the family supporting hand is son (25%) of women small ruminant rearer.

Table 2: Socioeconomic characteristics of respondents.

Parameters	Categories	Frequency	%
Age	Below 25	4	6.67
	26-34	16	26.67
	35-44	15	25.00
	45-54	17	28.33
Education	Illiterate	13	21.67
	I-V	26	43.33
	VI-IX	12	20.00
	SSC	7	11.67
	HSC and above	2	3.33
Occupation	Housewife only	50	83.33
	Housewife, farming	2	3.33
	Housewife, tailor	3	5.00
	Housewife, shopkeeper	2	3.33
	Housewife, service holder	1	1.67
	Housewife, craft maker	2	3.33
Training	Yes	7	11.67
	No	53	88.33
Average Family Size (number)		5.72	
Average Farm size (acre)		0.27	
Dependency ratio		26.53	
Annual income of women from SR (Tk.)	10000-below 12000	9	15.00
	12000-21000	31	51.67
	22000-31000	7	11.67
	32000-41000	3	5.00
	42000-51000	1	1.67
	52000 and above	9	15.00

Source: Field survey, 2019; I-V: Class one to five; VI-IX: Class six to ten; SSC: Secondary School Certificate; HSC: Higher Secondary Certificate. SR: Small ruminant (sheep and/ goat)

Access to credit

In Bangladesh different microfinance activities are provided by formal institutions (eg. Bangladesh Krishi Bank, Grameen Bank etc.). Semi-formal institutions (NGOs like BRAC, Proshika, ASA, etc.) and informal sources (such as friends, relatives, money lenders). In the study areas, 27 % respondent didn't get any credit from any institutions. Though 42 % respondent have access to NGOs for credit followed by Bank (23%), friends and relatives (5%) and money lender (3%) (Figure 3). Ayoade et al. (2009) found 86.7% of the women in livestock production had no access to credit facility because they have no collateral.

Access to credit

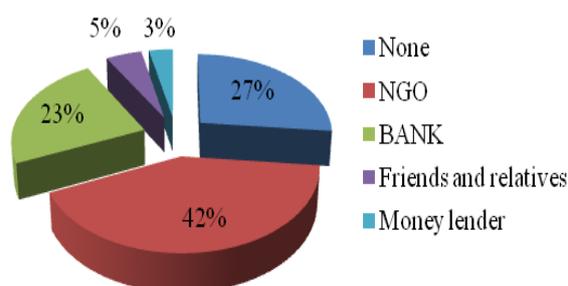


Figure 3: Access to credit

Supporting members of women rearer

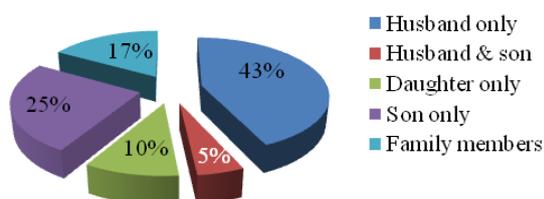


Figure 2: Supporting members of women SR rearer.

Average monthly income

Income is an important indicator of socioeconomic status of the people. Average monthly income of respondent's family has been shown in Figure 4. The figure shows that business has greater contribution to monthly family income which estimated BDT 6557.69 compared to agriculture (BDT 6254.41), SR (BDT 4209.31), selling labour (BDT 3770.80), service (BDT 3475.72), cattle/buffalo (BDT

1341.30) and remittance (BDT 934.74). It can be concluded that women contribute third largest proportion of income through small ruminant (SR) mainly sheep and goat production in household income. Rahman (2013) found that women's contribution to household income is BDT 34500.00 and Roy et al. (2017) also found that it was BDT 37400.00 which supports the present study.

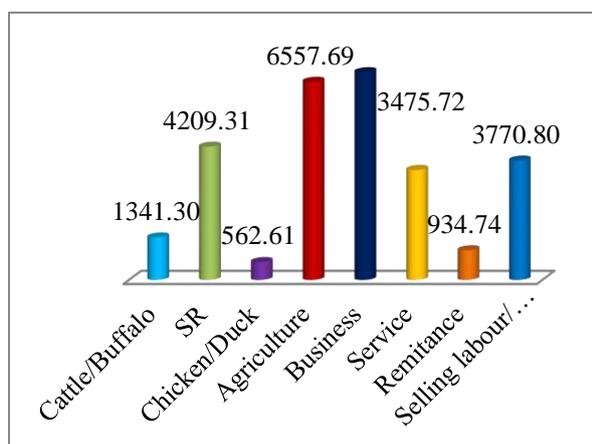


Figure 4: Average monthly income of respondents

Women's contribution to household income

The results indicates that income from sheep and goat has positive and significant effect ($P < 0.01$) on household income (Table 3). It implies that one percent increase in income of women through sheep and goat rearing, would lead to an increase in household income 0.41 percent, holding other variables constant. The study also revealed that there was positive but non-significant relationship between household income, age and education of women. It was demonstrated that aged and educated women play vital role in household income. Moreover

access to credit of women has positive effect on household income and the relationship tends to be significant ($P < 0.1$). The regression coefficient of family size was 0.826 and statistically significant ($P < 0.01$). It means that holding all other variables constant, for every additional family size, household income increases by 0.826 on an average. Farm size was also positive and significant ($P < 0.01$) indicates that one percent increase in farm size would lead to increase in household income 0.345 percent, holding others variables constant. This finding agrees with that of Roy et al. (2017) who reported one percent increase in farm size would lead to an increase in women's contribution to household income by 0.037 percent, holding all other variables constant. Experience is another variable that significantly contribute on household income ($P < 0.05$) means, if women are more experienced, they can contribute to increase household income, holding other variables constant (Table 3). The coefficient of determination (R^2) was 0.561 implies that about 56 percent of the variation in women contribution to household income was explained by the set of explanatory variables (income from sheep and goat, age, education, family size, farm size, experience and credit) in the model. The value of adjusted R^2 was 0.502 indicates that after taking into account the degrees of freedom (d. f.), the seven explanatory variables included in the model still accounted for 50.20 percent of the variation in the household income. Roy et al. (2017) found coefficient of determination (R^2) was 0.822 and value of adjusted R^2 was 0.782 which support the present study. The F-value stood at 9.51 and was significant ($P < 0.01$). It measures the overall goodness of fit of the estimated regression model.

Table 3: Estimated values of co-efficient and related statistics.

Household income	Coefficient	Standard. Error.	P -value
Income from sheep & goat(X_1)	0.410***	0.096	0.000
Age(X_2)	0.241	0.271	0.380
Education(X_3)	0.143	0.168	0.398
Family size(X_4)	0.826***	0.205	0.000
Farm size(X_5)	0.345***	0.113	0.004
Experience(X_6)	0.219**	0.092	0.022
Access to Credit(X_7)	0.376	0.221	0.095
constant	4.253***	1.277	0.002
R^2		0.561	
Adjusted R^2		0.502	
F-value	9.51***		0.0000

Source: Author's estimation based on field survey, 2019. Note: ***=Significance of 1%; **= Significance of 5% and *= Significance of 10%.

Problems of small ruminant's production

Table 4 and figure 5 shows that the major problem of women (100%) to small ruminant production was diseases. Small ruminants were affected by several diseases like Peste des Petits Ruminants (PPR), Foot and Mouth Diseases (FMD), Diarrhea, Goat-fox, Pneumonia, Cold, fever etc. in the study areas which ranked first. The 2nd highest ranked problem faced by women in small ruminant production was lack of capital (83%). The result of this study was similar with Ayoade et al. (2009) where they reported that 81 percent respondent opined the problem of lack of capital. Similarly, third ranked was problem of thief. Small ruminant was stolen by thief in the study areas claimed by 40 percent of total respondent. Other problems identified among the respondents were rain (37%), distance of market and high feed cost (33%), lack of space (27%), lack of land (23%), price fluctuation (17%), lack of training (8%) and lack of good variety of animal (5%) (Table 5).

Table 4: Problems identified from respondents

Problem	Frequency	%	Rank
Problem of thief	24	40.00	3
Lack of land	14	23.33	8
High feed cost	20	33.33	5
Lack of good variety	3	5.00	11
Lack of space	16	26.67	7
Lack of training	5	8.33	10
Lack of capital	50	83.33	2
Distance of market	20	33.33	5
Diseases	60	100	1
Price fluctuation	10	16.67	9
Rain	22	36.67	4

Source: Field survey, 2019

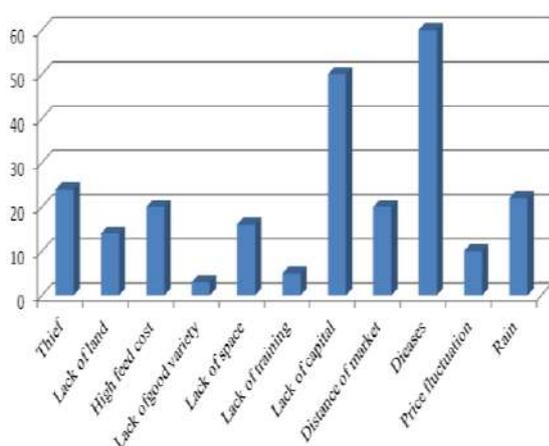


Figure 5: Problems faced by women in small ruminant production

4. CONCLUSIONS

Personal income of women is an essential precondition to enhancing household income. From this study we found that women contribute third largest proportion of total monthly income in a family through small ruminant (sheep and goat) production. It also disclosed that household income is positively related with women's income, family size, farm size and the relationship were significant. Women's age, education and access to credit have positive but non-significant effect on household income. The coefficient of determination (R^2) was 0.561 implies that about 56 percent of the variation of household income was explained by the set of explanatory variables in the model. Diseases, problem of thief, lack of capital, lack of land, high feed cost, lack of space, lack of training, lack of good variety, price fluctuation and distance of market are major constraints that faced by women in small ruminant rearing. It was clearly proved that the rural women were always tried to improve their livelihood status and played a crucial role to magnify the household income as well as national income. They can contribute a lot to their family as well as country if suitable atmosphere and facilities can be ensured.

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