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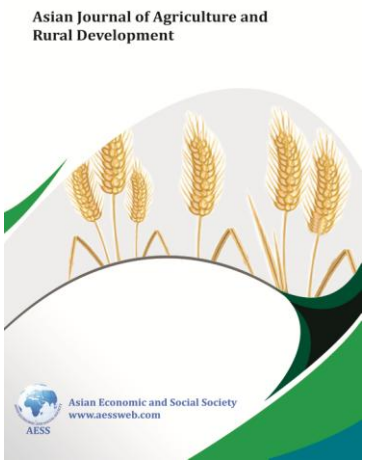

Rural Women in Livestock and Fisheries Production Activities: an Empirical Study on Some Selected Coastal Villages in Bangladesh

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Abstract

Progressive participation of women in agriculture is evident throughout the Globe. Their participation in fisheries and livestock sector is well recognized but less perceived due to paucity of sufficient data. Considering this fact the present study had been designed to examine women's participation in fisheries and livestock activities as well as influence of selected socio-economic factors on their participation in some selected coastal villages of Bangladesh. For achieving research objectives a well structured interview schedule was administered on 70 randomly selected rural women during the period of September, 2010. Descriptive statistics exhibit that almost three quarter of the respondents had moderate to high level participation in fisheries and livestock activities. Among the fisheries related activities women had highest participation in feed application (M=1.528) while cleaning cattle shed (M=2.914) and giving feed to poultry birds (M=4.571) occupied the top ranks for cattle and poultry related activities. According to correlation estimates agricultural knowledge and family size had strong positive correlation with women's participation where as education and family income had negative significant correlation with women's participation in fisheries and livestock activities. Stepwise multiple regression mirrored that family size, agricultural knowledge and education jointly contribute to 25.6% variance in women's participation in fisheries and livestock activities.

Keywords: Rural women, participation, Fisheries and livestock activates

Introduction

Women are playing an increasingly important role in agriculture and rural development both at national and international levels. Due to potential contribution to the reduction of poverty, increased food security and enhancement of environmental sustainability female economic activity in agriculture has snatched special attention (Muller, 1989). Over half of the world's food is produced by women (Johnson, 1998) and they contribute to half of the total labor force in agriculture (Das, 1995; Food and Agriculture Organization, 1995). Women are involved exclusively in agricultural operation all over the world. A convincing body of research literature documented that participation in various agricultural activities having complementary roles, sharing activities related to crop production, livestock production and management, fish farming and forest management with her male counterpart (Franzel and Helen, 1992; Saito and Spurling, 1992; Sharma et al., 1997; Ahmad and Ismail, 1998; Lovenbalk et al., 2003; Oladeji, 2004; Oyesola, 2004). In some parts of the world their involvement in agricultural activities is even higher than that of man (Prakash, 2003; Tacio, 2003).

Bangladesh is an agro-based over-populated country. Development of socio-economic

condition of Bangladesh mostly depends upon the development of the village. Women in rural Bangladesh are major but largely unrecognized contributors to agricultural and economic productivity. Various studies show that 43% of rural women are contributing to agriculture and fisheries-related activities besides performing their household responsibilities (Shelly and D,costa, 2001). Women in Bangladesh are responsible for grain processing and storage. They grow most of the family's fruits and vegetables and participate in post harvest activities. They care for poultry and livestock (Kabir et al 1977). Feeding livestock, cleaning sheds, securing them properly for the night and health care are activities performed by women (Food and Agriculture Organization, 2012). Women in Bangladesh have diversified roles in fisheries, with substantial involvement in small-scale fisheries. They, to a large extent, carry out drying, curing, and marketing of fish as hawkers, stall keepers in permanent market place and weekly bazaars. Women are also predominantly involved in net-making, the main income generating occupation in many families, and fresh water fish farming (Food and Agriculture Organization, 1980). In fact it is well documented that women alone or jointly with men, participate in nearly all dimensions of agricultural activities (Rothschild and Mahmud, 1989). Despite the fact women role in agricultural production grab less recognition because they do many other quasi-economic activities which are not valued in national income accounting (Hossain, 2004; Kabir et al., 1977).

Bangladesh in recent years has been experiencing a scarcity of rural agricultural labor force and farm technologies have not yet been properly updated to cope with this labor shortage. Therefore, women participation, particularly in agriculture as entrepreneurs is increasing day by day (Hossain and Jaim 2011; Birner et al., 2010). Women participation in agriculture has increased from 58 percent in 2000 to 66 percent in 2008. The allocation of time in agricultural activities has also climbed up to 1.28 hours per day from 1.11 hours each day (Jaim and Hossain, 2011). In the absence of male members, women's role is changing from unpaid family worker to farm managers, a phenomenon termed as "feminization of agriculture".

This study seeks to explore participation of women in the southern coastal part of Bangladesh where agriculture land use is very poor, roughly 50% of the countries average (Peterson and Shireen, 2001). Due to shrinkage of employment opportunity in agriculture sector a large segment of agrarian population move to big cities for their job. This male migration can probably be identified as one of the major causes of "feminization of agriculture" in the coastal region. Despite the fact the overall agricultural production in this region is often hampered due to occurrence of frequent events of natural disaster (Ferdousi, 2007; World Bank, 2005; Kalequzzaman, 1988). A good number of literature concluded that small scale aquaculture and livestock have prospective potential in improving livelihood of poor including women (Ali, 2011; Kabir et al.,2012; Ahmed et al., 2012). This study strongly believes that to become successful with such interventions women participation in both of these sectors need to be underpinned properly. However the study was preceded with the following three specific objectives:

1. To describe some selected socio-economic characteristics of women in selected coastal villages.
2. Examine the involvement of women farmers in livestock and fisheries activities in some selected coastal villages.
3. Analyze influence of selected socio-economic factors on women's role in livestock and fisheries production.

Women in Livestock and Fisheries Activates

Women participation in agricultural activities has gained momentum since last few decades almost all over the world. In Canada, 25 per cent of the farm owners are women, and 47 per cent of females comprise the enumerated farm population. In the said study population, half of the rural women are homemakers yet are also involved in farm activities (Dimich-Ward et al., 2004). The female contribution to the overall economy, particularly in agriculture is high throughout Asia (Food and Agriculture Organization, 2003). In China, women

constitute about 70 per cent of the agricultural labor force and perform more than 70 percent of farm labor .In India, 75 per cent of all women workers are in agriculture (Kelkar, 2009). Even in comparison with other business segments, women's participation in agriculture is relatively increasing (Meeker et al., 2002).

Several literature mirrored that women's involvement in agricultural operation varies from country to country even from region to region due to country and reason specific change in social setup (Javed et al., 2006). However, it is so far widely acknowledged that women perform most of the activities related to livestock production and management (Tulachan and Karki, 2000). Reviewing literature on the household labor issues in West Asia and North Africa Tully (1990) concluded that female labor is important in most livestock production activities except shearing, slaughtering and transporting water and fodder. Women were involved in lighter work that does not demand heavy physical effort, but care and practice (Saito and Spurling, 1992). Rangnekar, et al. (1991) in India also expressed similar opinion. Several studies focused the role of women in agriculture in Jordan have disclose the high contribution of women in livestock production (Brandenburg, 1993; Himour, 1994; Brockhaus, 1996). Even it is also reported that women work in livestock in a better way than their male counterpart. In fact in every household woman spend 2.2 h/day for animal care activities (Agarwal et al., 1999). In reference to another survey finding women often devote more times from 16-18 h against 8-10 h by man in a day to these tasks (Food and Agriculture Organization, 2012). A report of United Nations Development Program mirrored that rural women's participation in crop and livestock production activities is about 79.4% which is 19.4% higher than that of man. In Pakistan a rural women works 15.5 h a day, spending 5.50 h in caring livestock but provides only 50 min for caring her children (Economic and Social Commission for Asia and the Pacific, 1997). In Bangladesh, being a traditional Muslim society, women hardly participate in agricultural activities outside home (Hossain and Bayes, 2009; Abdullah and Zeidenstein, 1982). Women's agricultural activities were confined to homestead production and post-harvest operations; however, in recent years they are mostly involved in livestock and poultry rearing activities besides crop (Jaim and Hossain, 2011). In a study to determine the contribution of women in raising livestock for generating family income and employment in rural Bangladesh on 600 households from 6 districts Jahangir, *et al*., (2003) revealed that participation of women were 37.34%, 44.48%, 46.70% and 55.80% for large, medium, small and landless farms, respectively . Women are actively involved in forestry, fisheries and livestock production. In general women in Bangladesh are responsible for livestock and poultry rearing (Food and Agriculture Organization, 2012). However, we are not aware about any study concerning coastal women participation in livestock activities Bangladesh.

Reviews concerning most of the Asian countries except Middle East exhibit that women are actively involved in many aspects of fisheries (Siason, et al., undated). For example, in Cambodia, higher yields are obtained from fish ponds managed mainly by women. In Thailand and China, they often bear the sole responsibility of farm and aquaculture production because of male migration to cities (Ahmed et al., 2012) Last decade has witnessed a dramatic progress in inland fresh water aquaculture production in Bangladesh, growing at an annual average rate of nearly 20% (Muir, 2003). Around 400000 ha of freshwater ponds and ditches are used for aquaculture and more than 900000 household are involved in aquaculture activities (Asian Development Bank, 2005)) They are directly involvement of women in activities like making fishing nets, gears, repair and maintenance of the gears, sorting of fingerlings (especially in coastal areas), fish processing, transportation, marketing etc (Ahmed et al.,2012) By undertaking pond fisheries activities, women can contribute considerably to family income, ensure constant, supply of much needed nutrition, generate self-employment, uplift overall socio-economic condition and become more skilled (Shelly and D'Costa, 2001).

Materials and Methods

This study was conducted in some selected villages of a coastal district in Bangladesh known as Patuakhali. This district found its position in the south-western part of the county where main occupation for living is agriculture and fishing. Small scale homestead based rearing of livestock and poultry is also common. Primary data were collected using a structured interview schedule from a sample of 70 female farmers during the period September, 2010.

Simple descriptive statistics such as mean, median, standard deviation and range were used to achieve objective 1. Women involvement in livestock and fisheries activities was measured by a six point scale on 21 selected items. To be precise about the participation of women we also consider whether they do the selected activities alone or with other male and/or female companion. The response categories on the scale were Solely(regular) =5, solely(irregular) =4, with other (female) =3, with other (male) =2 and with others (both male and female) =1 and no participation= 0**.** Hence, score of women's participation in 21 selected items could range from 0-105. To have a deeper understanding about women involvement in the selected activities and reach objective 2, a ranking was done on the basis of mean value of each item (Javed *et al.*, 2006).'Pearson's correlation test' and Stepwise multiple regression analysis was used to achieve objective 3. All the analysis of data was done by SPSS 11.5 software.

Results

In this section before having correlation and regression estimates descriptive analysis is presented in Table1. Basic statistical concepts like mean, median, standard deviation, minimum and maximum are used as basis for descriptive analysis. In the third column results show that average women's participation score in livestock and fisheries activities is 44.8. Values in the following columns show median, standard deviation, minimum and maximum. According to the results minimum participation value is o while the maximum value is 87. A compete detail of the rest of the variables can be observed from Table 1.

Table1: Descriptive Statistics of Some Selected Characteristics of Coastal Women (N=70)

Selected characteristics	Scoring method	Mean	Median	Std. dev.	Min.	Max.
Age	Year	35.92	35.00	9.19	21.00	57.00
Education	Year of schooling	5.47	5.00	3.79	0.00	16.00
Family size	Number of members	6.12	6.00	2.14	2.00	12.00
Farm size	Hectare	0.787	0.410	1.04	0.01	5.81
Annual income	Thousand taka*/year	81.35	56.85	74.92	10.00	410.70
Agricultural knowledge	Score	16.32	17.00	4.38	4.00	25.00
Decision making role	Score	21.6	23.00	6.57	4.00	30.00
Non-localite behavior	Score	6.85	4.00	11.70	0.00	90.00
Training exposure	No. of days	13.70	0.00	54.05	0.00	365.0
Fatalism	Score	7.45	8.00	5.05	0.00	22.00
Media exposure	Score	5.01	5.00	4.71	0.00	23.00
Participation in livestock and fisheries activities	Score	44.8	40	17.40	0.00	87.00

*83 Taka = 1 USD

Overall scores of women's participation in selected livestock and fisheries activities represented that a little more than half (52.8%) of the women had medium level participation while almost one fourth (24.3%) had low participation and the rest 22.9 % women had high participation in selected livestock and fisheries activities with standard deviation 17.40.

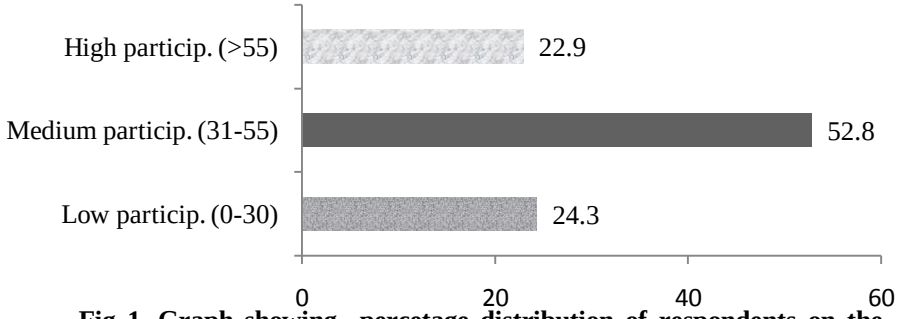

Fig 1. Graph showing percetage distribution of respondents on the basis of participation level

Data presented in Table 2 depicts that among fisheries activities women's participation in food application ranks at the top (M=1.528) followed by taking care (M=1.20), catching fish (M=0.842), collection of fish fry (M=0.714), Selling of fish (M=0.671) and Pond preparation (M=0.571).

Table 2: Participation of Coastal Women in Selected Fisheries Activities

Activities	Mean Score	Rank
Pond preparation	0.571	6
Collection of fish fry	0.714	4
Food application	1.528	1
Taking care	1.20	2
Catching fish	0.842	3
Selling of fish	0.671	5

Scale: Solely (regular) =5, solely (irregular) =4, with other female=3, with other male=2, with other male and female=1, No participation =0

Women's participation in livestock sector was estimated in two basic sectors such as cattle and poultry. In cattle sector top three activities having increased women participation in rank order were cleaning livestock shed (M=2.914), taking care of livestock (M=2.742) and giving food (M=2.557). In case of participation in poultry related activities women had highest participation in giving feed (M=4.571) followed by cleaning poultry shed (M=4.342), egg collection and selling (M=4.157), collection of poultry birds (M= 3.542), treatment of poultry birds (M=3.40) and selling of poultry birds (M=2.70).

Table 3: Participation of Coastal Women in Selected Livestock Activities

Activities	Mean score	Rank
Cattle		
Grazing of livestock	1.671	4
Purchase of livestock	0.728	7
Taking care of livestock	2.742	2
Cleaning livestock shed	2.914	1
Treatment of livestock	1.457	6
Giving feed	2.557	3
Milking	1.642	5
Selling of animal	0.557	8
Marketing of milk	0.542	9
Poultry		

Collection of poultry birds	3.542	4
Giving feed	4.571	1
Cleaning of shed	4.342	2
Treatment	3.40	5
Egg collection and selling	4.157	3
Poultry selling	2.70	6

Scale: solely (regular) =5, solely (irregular) =4, with other female=3, with other male=2, with other male and female=1, no participation =0

The independent variables of the study were age, education, family size, farm size, annual income, agricultural knowledge, decision-making role, non-localite behavior, training exposure, fatalism and media exposure. Correlation test revealed that among the selected variable family size and agricultural knowledge had strong positive significant relationship with women's participation while education and annual income had negative significant relationship with women's participation in fisheries and livestock activities.

Table 4: Correlation of Different Selected Variables with Rural Women's Participation in Fisheries and Livestock Activities

Independent variable	**Participation in fisheries and livestock activities**
Age	0.79^{NS}
Education	-0.245*
Family size	0.323**
Farm size	0.029^{NS}
Annual income	-0.247*
Agricultural knowledge	0.307**
Decision making role	0.116^{NS}
Non-localite behavior	0.55^{NS}
Training exposure	-0.95^{NS}
Fatalism	0.181^{NS}
Media exposure	-0.090^{NS}

* Significant at 0.05 level of probability ** significant at 0.01 level of probability, NS= Non significant

Variables significantly correlated with participation of women in livestock and fisheries activities were entered in the regression equation. The results show that participation of women in livestock and fisheries activities is the function of family size (beta=2.134, ρ=0.006), agricultural knowledge (beta=1.408, ρ =.001) and education (beta=-1.179, ρ <0.0001). The estimates revealed that family size has the strongest contribution to the 10.5% variance of women's participation in livestock and fisheries activities, while agricultural knowledge and education contribute 9.1% and 6% consecutively, to the variance of women's participation in livestock and fisheries activities. Indeed all these variables jointly contribute 25.6% variance in women's participation in livestock and fisheries activities.

Table 5: Predicting Women's Participation In Livestock And Fisheries Activities

Variables	**R^2**	**Adj.R^2**	**β**	**SE**	**t**	**P**	**F**	**ρ**
Family size	0.105	0.091	2.134	0.892	2.239	0.020	7.940	0.006
Agricultural knowledge	0.196	0.172	1.408	0.430	3.272	0.002	8.186	0.001
Education	0.256	0.223	-1.179	0.511	-2.306	0.024	7.583	0.000

Discussion

The mean scores of the selected activities in table 2 represented that women's participation in fisheries sector is very low. The possible explanation could be that modern fish cultivation is still not very popular in the study area. Although most of the families have pond but they do not cultivate fish for commercial purpose rather they manage it in traditional way to meet family consumption only. It is so far well-known that traditional fish culture required less care and nursing. Mean scores depicted in table 3 documented that women participation in cattle sector was reasonably low compared to their participation in poultry sector. Nonetheless from the average score in poultry related activities it can be claimed that poultry related activities are predominantly done by women. In addition it is clear that women had very limited participation in the activities dealing with direct monetary benefits. In line with our findings other national and international (Javed et al., 2006) studies on women's participation in livestock and agricultural activities concluded that among all the activities women have least participation in selling and marketing. Feedback from a gender analysis workshop also posit that man manage the sale of livestock and income from the sale as well (GenCap, 2011).

Among the four significantly correlated (see table 4) variables family size and agricultural knowledge showed positive relationship while family income and education showed negative relationship with women's participation in fisheries and livestock production activities. Rokonuzzaman and Islam (2009) had almost similar findings in their study in Bangladesh on women's participation in goat rearing. Despite a convincing body of research done in home and abroad had finding those echoes our findings. Farid, et al., (2009) in Bangladesh found that level of education in negatively associated with women's participation. Khan, et al., (2012) in their study in Peshawar, Pakistan disclosed that income of family and level of education had significant negative effects on women's participation in crop and livestock production. Analyzing women's participation in cassava production in Nigeria Onyemauwa (2012) identified family income and level of education as important factors influencing women's participation. It has been a common observation that even a slight improvement in economic status of a family reduces pressure on women to engage in agricultural work. Wealthier families consider women's participation in agricultural activities as symbol of low social status. For instance, in rural Bangladesh women from well-to-do families generally do not engage in outside work, rather they devoted more time in childcare and domestic chores (Goldin, 1995). Chandy (undated) in his case studies in India documented that in general rural women remain more involved in household work since only low economic group of rural women take part in farming operations. In general regardless rural or urban when women become education they look for salaried job. Nevertheless social tradition does not encourage educated women to participate in agriculture related activities.

Stepwise multiple regression revealed family size as the strongest contributor to explain 10.5% variance of women's participation in fisheries and livestock production activities. In analyzing women labor participation in Agriculture production in Jaffna, Sri Lanka Abira and Sireeranhan (2012) also support our findings. Damira et al., (2007) noted that an increase in family size increased the probability of women's participation in agricultural production. This probability means that younger members of the household are not participating activity in agricultural production, because youth of modern days like white-collar job. In general more family members mean s need of more food and more income. In rural coastal region of Bangladesh opportunity for women involvement in non-farm income generating activates are very limited. The only way to cope with this increased demand it to work more in agriculture related sectors. However, contrasting our findings Oladejo et al., (2011) negate that household size is negatively associated with women's participation in agriculture.

Conclusion and Recommendations

From the findings it was concluded that almost 75% women had moderate to high level participation in selected fisheries and livestock activities. According to mean values top ranked activities related to fisheries, cattle and poultry

sector were feed application (M=1.528), cleaning cattle shed (M=2.914) and giving feed to poultry birds (M=4.71). Correlation coefficient revealed that agricultural knowledge and family size had strong significant relationship while education level and family income had significant negative relationship with women's participation in fisheries and livestock activities. The estimated of Stepwise Multiple Regression exhibit that three variables namely family size, agricultural knowledge and education jointly contribute 25.6% variance in women's participation in livestock and fisheries activities. Based on findings, the study come up with the following recommendations:

1. Women's participation livestock activities were widespread but they merely involve in selling of end products. Special marketing facilities need to be established so that women can sell their own products and achieved some economic freedom.
2. Gender specific small scale fish cultivation techniques need special consideration to ensure effective use of water resources and to promote increased participation of women in fisheries related activities as well.
3. Livestock extension programs especially small scale poultry raising technology extension is essential to improve the economic condition of coastal women as this sector is predominately controlled by them.
4. Agricultural knowledge is essential for successful running of family farms so special extension programs need to be launched to increase women's agricultural knowledge.

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