Contribution of rural women to rice production activities in two different areas of Bangladesh

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Abstract

The study was undertaken to identify the core contribution of women in the rice production activities, identify the wage gap between male and female laborer and factors influencing women's participation in rice farming at household level in Bangladesh. In doing so, the study utilized the data collected by the field survey from Nilphamari and Mymensingh districts of Bangladesh. A total number of 60 women respondents were selected using random sampling methods who were actively working in the rice fields during the production period in 2015. Data were analyzed using simple statistical techniques as well as OLS regression analysis. An analysis of the socioeconomic status of the women showed that in terms of contribution, nearly 43% and 42% of the total works were done by rural women in rice farming activities in Nilphamari and Mymensingh district, respectively. It was found that male workers spent 228.2 hours and female workers 174.5 hours per season in Nilphamari region compared to 270 hours and 197.3 hours per season in Mymensingh region, respectively. The average wage rate in Nilphamari district was BDT 241/day for male and BDT 175/day was female. Similarly, in Mymensingh district the average wage rate for male and female workers was BDT 281/day and BDT 162/day, respectively. The result of the OLS method suggests that the distance of the rice field from the home, the number of available technologies used and the number of adult male labour significantly affect the women's participation in farming activities. Despite the positive role of women in the production activities, their contribution was often neglected in terms of wage rate. Therefore, this study recommends the avoidance of wage discrimination between male and female workers which may strengthen their position within the family and increase their self-esteem and status in the society.

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Introduction

Bangladesh is predominantly an agro-based country, though diverse crops are also grown throughout the year. Agriculture in Bangladesh is largely dominated by rice production. Rice farming is a major source of income of most farmers and it provides employment opportunity to landless farmers as well. According to OECD-FAO (2015), Bangladesh ranked sixth in the world in rice production.

Almost all of the 15 million farm families in the country grow rice. It provides half of agricultural GDP, one-sixth of rural household income, half of rural employment, two-thirds of per capita daily calorie intake, and half of per capita daily protein intake (Gurung et al., 2013).

In Bangladesh, women's' participation in rice farming is increasing day by day. In rural areas, a large number of families are becoming dependent on female wage labor for basic family income. However, the majority of the field level production works are performed by male members with

available technologies whereas female members are responsible in every stage of rice farming namely like seedling, nursing, harvesting, rice storing, seed preservation, straw drying, weeding, thinning, cleaning, boiling of grain, threshing, drying, husking etc., where technology is less available. The responsibility of individual women for completion of these tasks depends to a large extent on their position within the family.

Though Bangladesh is predominantly a male-headed country, there is a large number of divorced or widowed women. Women of this section would seek employment on farms of richer peasants in rice processing and domestic household work in order to meet their income requirement for their livelihood (Begum, 1985) as long as they do not migrate or if they do not get support from other family members.

There is a no doubt that women are an essential part in the household and farm activities but their contributions are rarely considered and valued. Unlike male, their contribution are not accounted and credited by their family. Traditionally they themselves are also not aware about their contribution. This unawareness or self-un-realization has put them in backward position in their family and society. Even how much they contribute to improve the wellbeing of their family by participating in various production activities is also not measured. Therefore, for women empowerment, it is important to assess, acknowledge and emphasize the important role that they traditionally have played in agriculture. In Bangladesh, only few studies have been addressed on women contribution in farming, but no study has been conducted in the areas selected for this study. Therefore, the present study was an attempt to examine the contribution of women considering rice farming as a case, based on the contribution of rural women in different rice farming activities, identify the wage gap between male and female labor, and analyze factors influencing women's participation in rice farming.

Materials and Methods

In order to realize the objectives of the study, the study selected two different rice producing regions of Bangladesh *viz.* Nilphamari and Mymensingh which have a long history of rice production. Why these two regions? Normally, in the Northern Bangladesh, we see that women are working in the rice and vegetable field as day labourer which is their regular routine but in Mymensingh, we do not see. Therefore, it was our assumption that women workers of Nilphamari may contribute more than workers from Mymensingh district. Simple random sampling technique was used to select two villages and households from each district for data collection. Finally, survey method was followed to collect the primary data from a total of 60 households in which 30 was from Nilphamari district and 30 was from Mymensingh district. During our 3-month long field study, we chose those women who were working for those households, either as family labour or hired labour. In case of family labour, we calculated the opportunity cost of wage rate. In total, we took 67 females and 42 males in Nilphamari and 56 female and 47 males in Mymensingh district who were working in those households. As this paper deals with contribution of women, we are going to analyze the cases of 67 and 56 female rice workers from Nilphamari and Mymensingh district respectively. Descriptive analyses were employed to analyze the respondents' socioeconomic status, contribution of women in rice farming activities, and wage gap between male and female labor. Finally, to analyze the factors influencing women's participation in rice farming, the Ordinary Least Square (OLS) regression method was employed. The specification of the OLS method is of the following form:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \mu_i$$

Where, the variables are specified as follows:

Y_i = number of working hours by women

X_1 = Farm size (ha.)

X_2 = wage rate for female labour (BDT/man-days)

X_3 = Distance from rice field to home (km)

X_4 = No. of technologies used

X_5 = No. of available adult male in the family

X_6 = Area of rice field under irrigation (acre)

X_7 = Farming experience (years)

X_8 = Cultural barriers as dummy variable

β_0 = Intercept

β_1- β_8 = Coefficients of respective input variables

μ_i = Error term

Results and Discussion

Socioeconomic status of rural women

Socioeconomic situation plays a vital role in knowing the contribution of women in their farming activities. Therefore, the present study identified a number of socioeconomic variables which have great effect on the women's decision to participate in farming activities in the study areas. These are age of the respondents, education level of the family members, household size, family members' occupational status, farm size of household, land ownership pattern, income generation and infrastructural facility available in the village. These characteristics are summarized in Table 1.

Table 1. Age, education, household size, occupation, farm size, land ownership pattern, income generation and infrastructural facility available in the village

Variables	Classification	Nilphamari	Mymensingh
Age distribution (%)	16-20	41.48	51.50
	21-30	19.25	30.75
	31-40	24.07	13.32
	41-50	14.70	3.77
Education level (%)	Pre-school	21.74	17.24
	Primary	26.08	20.68
	Bellow SSC	45.65	44.83
	HSC	6.67	17.24
Average education level (years)		8.33	7.92
Family size (%)	< 5	25.00	45.00
	Between 5-10	65.00	50.00
	> 10	10.00	5.00
Average family size (No.)		6.67	5.89
Family member's occupation (%)	Student	11.11	17.86
	Day labor	5.56	8.93
	Farming	29.63	26.79
	Service	0.00	1.79
	Business	1.85	7.14
Average total land (acres)	-	0.90	1.32
Farming experience of women (years)	-	6.3	4.75
Income level of household (%)	Income from all farming	69.00	63.00
	Income from only rice farming	18.00	25.00
	Income from non-farm activities	10.00	7.00
	Others	3.00	5.00
Infrastructural facility (Km)	Distance from market to home	2.71	1.55
	Distance from market to rice field	1.15	1.1
	Distance from home to rice field	0.975	1.275
	Distance from bus stop to village	1.15	1.9
Area of land under irrigation (acres)	-	0.28	0.37

Source: Field survey, 2015

It was found that a large percentage of the women workers in both of the districts were under the age group of between 16-20 years. However, their mean age was 17.7 years for Nilphamari district and 19.4 years for Mymensingh district, which may mean that mostly very young women groups are working for rice production. Literacy rate was 40% in Nilphamari and 53% in Mymensingh region. According to female workers, "most of the village people think that female education is less important for our life.

As a result, the level of education of women is low". The respondents had the mean level of education up to 8 years which means that they did not appear in the national exam, that formally certify about their quality. The respondents of Nilphamari region had a family consisting of 6.67 members whereas for Mymensingh region, it was 5.89; both of which were higher than the average national family size of 4.53 according to Household Income and Expenditure Survey (HIES, 2010). Most of the family members in both areas were student and 29.63% of household members in Nilphamari district took farming as their main occupation while for Mymensingh region, the figure was 26.79%.A very minor number of households were engaged in service and business activities (0.00% and 1.85%) in Nilphamari district whereas the number was little bigger for Mymensingh district (1.79% and 7.14%). The reason for that might be having zero or only primary level of education of the older people within the family. The farm size of the households was classified as marginal, small, medium and large according to BBS, 2013 and was estimated that 55% in respondents of Nilphamari and 75% respondents of Mymensingh region belonged to small farm size holders and the rests were medium categories. In addition, no large farm was found among the respondents in both of the study areas, as large farmers are normally very irregular in farming activities, only hired workers work in their farm who are not able to tell about their works, as the management part is done by the land owners. The mean farm size was 0.90 acre and 1.32 acre for Nilphamari and Mymensingh region of which 52% and 39.39% were own land and the rest of the land were under tenure arrangement of land rented in and rented out. Majority of the income of the women households were coming from their faming activities whereas 18% and 25% income was from only rice production for Nilphamari and Mymensingh regions.

The study attempted to look at the scenario of infrastructural facilities available in the village that was characterized by different available facilities like distance from market, distance from field to home, distance from the nearest bus stop, irrigation facilities and the farming experiences of the households. Among these facilities, the study considered distance of rice field from home as the important infrastructural facility for the analysis of the present study. Therefore, it was observed that the average distance was 0.975 km for the respondents in Nilphamari region and 1.275 km for the respondents in Mymensingh region. If the working place was far from home for several respondents, women had to spent much time walking to and from the rice fields, and it reduced their efficiency of work for not being able to utilize their time even after doing the family work. It could be mentioned here that the work for hired labours may not be fixed in one farm; they work in different farms based on the availability of work.

Contribution of women in rice farming in the study areas

The present study measured the contribution of rural women in rice farming by analyzing the average time allocation (hours spent/day) by male and female on agricultural activities. The result is summarized in Table 2.

The analysis showed that comparatively male workers were less involved in post-harvest operations than female members (Table 2). Beside household activities, women were engaged in almost all agricultural activities like seedling nursing, weeding, threshing, cleaning and sorting of grain, boiling of grain, drying of straw and rice storing. Traditionally rice processing and other post-harvest operations were performed by two classes of women, i.e. family farm women and wage labor women. In Nilphamari region, it was found that male workers spent 228.2 hours per season compare to female workers 174.5 hours per season. In Mymensingh region, male workers spent270 hours per season compare to female workers 197.3 hours per season. The fact that women have to prepare the food and do other household chores before going to the farm, leads to a drop in the number of hours than their male counterpart that they should devote for rice cultivation. It may be mentioned here that at household level, women sometimes play double role. Along with their reproductive works, they also take care for rice. In that case, their contribution for rice may be underestimated. If we consider their absence at home, then we may need to hire more than one or

two labours instead of one family labours. So, our feeling is to consider the issue in future research.

Wage gap between male and female labor in the study areas

The present study encountered wage gap between male and female workers for different types of farming activities. The average wage rates for male and female workers of the two study areas have been presented in Table 3. Table 3 describes that in both study areas male workers were performing mainly the field level work and got higher wage for harvesting activities which is considered as a hard physical work in Bangladesh. Their higher average wage rate in Nilphamari district was BDT 400/day for harvesting and low wage rate was for pesticide application which was BDT 96/day. Whereas, the

women respondents were getting their average higher wage for rice preservation which was BDT 221/day followed by the lower wage rate for straw drying which was BDT 155/day. Similarly, in Mymensingh district the average high and low wage rate for male and female workers was BDT 380/day and BDT100/day, and BDT 200/day and BDT 150/day, respectively for the same activities. It was also clear from table 2 and 3 that though the male workers were not much involved in post-harvest operations, but still they got higher wages for their job than their female counterpart. There was a significant difference between the wages paid to male and female workers though the involvement of women in rice farming activities was recognized as a crucial factor.

Table 2. Average time allocation of male and female workers in agricultural activities during 2015

SL No	Name of activities	Working days in a season	Nilphamari (hours/day)		Mymensingh (hours/day)	
			Male	Female	Male	Female
1.	Seed bed preparation	3	7.5	1.3	7.5	-
2.	Seedling nursing	2	6.7	7.5	4.3	6.2
3.	Land preparation	4	7.3	-	7.3	-
4.	Transplanting	5	6.4	-	7.1	-
5.	Fertilization	2	1.1	-	1.1	-
6.	Weeding/Thinning/gap filling	6	7.2	8.5	6.5	7.4
7.	Irrigation	1	7.5	-	7	-
8.	Pesticide application	4	1.9	-	1.3	-
9.	Harvesting	2	8.1	5.4	7.6	6.3
10.	Threshing, cleaning and sorting of grain	3	6.4	7.2	6.7	7.8
11.	Boiling of grain, Drying, de-husking of the grain	8	1.2	4.4	5.2	6.6
12.	Preservation of rice seed	3	1.5	2.3	2.8	3.4
13.	Drying of straw	5	3.5	4.5	5.7	6.1
14.	Rice storing	2	1.8	3.8	3.5	5.5
Total working hours/Season			**228.2**	**174.5**	**270**	**197.3**
Percentage of total working hours			**56.66%**	**43.33%**	**57.77%**	**42.22%**

Source: Authors' calculation based on field survey, 2015

Alternatively, it was noted that females were less involved in work like seed bed preparation, land preparation, transplanting, fertilizer application, irrigation and pesticide application in both of the

study areas. On an average, there was little difference between the wage rate of male and female workers in both regions. Therefore, the aggregate average wage rate was found as BDT 265/man-days for male

whereas it was BDT 233/day for female. This wage gap varied depending on the types of works and physical strength. Finally, it can be concluded that despite variations in wage rate for various types of works, male always got higher wage than female. Due to this kind of wage discrimination, women feel preventive them to be engaged in same type of works as men do. This occupational segregation creates gender discrimination.

Factors influencing women's participation in rice farming

In the study areas, women acted deliberately in rice cultivation and relied on their income from rice to meet a variety of needs. But various factors were hindering them to effectively work in the field.

Therefore, statistical analysis using the OLS regression has been conducted to find out the relative contribution of various factors towards women's participation in rice field as well as women's working hours. The result of OLS method has been summarized in Table 4 and the interpretations has been explained accordingly.

From Table 4 it can be interpreted that among the 8 variables that were supposed to affect the participation of women in the rice field, only 3 variables specifically distance of rice field from home, the number of available technologies use and the number of available male adult within the family were significantly affecting the women's decision to join to work in the field.

Table 3. Wage rate comparison between male and female workers under different rice farming activities during 2015

SL No	Name of Activities	Average wage rate according to activities			
		Nilphamari (in BDT)		Mymensingh (in BDT)	
		Male	Female	Male	Female
1.	Seed bed preparation	328	-	343	-
2.	Seedling nursing	245	205	250	200
3.	Land preparation	288	-	300	-
4.	Transplanting	276	-	265	-
5.	Fertilizer application	104	-	150	-
6.	Weeding/ Thinning/gap filling	200	169	213	150
7.	Irrigation	300	-	300	-
8.	Pesticide application	220	-	200	-
9.	Harvesting	400	152	380	150
10.	Threshing, cleaning and sorting of grain	200	180	189	150
11.	Boiling of grain, Drying, de-husking of the grain	281	150	280	150
12.	Preservation of rice seed	220	221	250	180
13.	Drying of straw	306	155	300	168
14.	Rice storing	240	196	250	150
Average wage rate (in BDT)		**241**	**175**	**281**	162

Source: Authors' calculation based on field survey, 2015

The regression co-efficient of distance from rice field to home has a negative effect on women's participation decision. If distance is less, then women can go to field within very short period and work. For going to low paid works, normally they do not use any vehicle. As the workplace is far, so they need to walk longer, that decreases their working time. Therefore, they get less time for reproductive work that sometimes create problem in their family.

Women very often did not get proper cooperation from their family members. Men or elderly people even the children become angry, when cooking is late and food is not ready in time. So, it is a mental stress for women to cook always timely. Young women also face some kind of provocation by very few local males while going to work that makes them departed from economic activities which can have a great impact on the improvement of living standard.

Different kinds of violence were reported against girls and women. It could be serious threats for their physical and mental health. Actually, going far to work outside for female was not socially and culturally accepted. So, some people still want to

hold the culture and therefore, some women feel hesitate which further prevented them from getting the leadership position within the family and the society as well.

Table 4. Regression analysis of the various factors affecting rural women's participation in the field during 2015

Model variable	Un-standardized Coefficients		T value	Significance
	Coefficient (b)	Std. error		
(Constant)	50.576	9.028	5.602	0.000
Farm size	-0.034	0.045	-0.759	0.453
Wage rate (Female)	-0.199	0.186	-1.071	0.292
Distance from rice field to home	-2.17***	1.068	-2.032	0.001
No. of technologies using in production	-2.894***	0.542	-5.339	0.000
No. of available adult male	-1.682***	0.387	-4.346	0.000
Area of rice field under irrigation	0.072	0.100	0.727	0.473
Farming Experience	-0.401	0.420	-0.953	0.347
Cultural barriers	2.524	1.830	1.379	0.177
Adjusted R^2	0.734			

Source: Authors' calculation based on field survey, 2015, Note: *** significant at 1 percent level.

Communication problem was also found as a constraint for women's involvement in rice farming. They could not bring and sell their product by themselves in the market. Very often they needed to depend on other or paid labor to sell their products in the market. In addition, physical weakness was another problem faced by most of the women due to long walking. About 69% women in Nilphamari and 52% women in Mymensingh district disclosed about their physical condition. They reported that due to huge workload, long distance traveling every day and the lack of sufficient nutritional food that they eat less than male members in the family makes them physically weak. On the contrary, physical weakness was also a cause of wage discrimination between male and female workers which is considered as a major policy issue.

The use of modern technologies in the field may reduce women's participation in the rice field. It means the technology use has a negative impact on women's participation, it saves their time and women do not need to work for long time. But unfortunately, women are involved in those activities for which less technology are available. Sometimes, due to

available and cheaper price, women labours are replaced of technology. Moreover, as women in Bangladesh are not trained to use technologies like power tiller, harvester, they cannot use the technologies properly in the field. Therefore, they are considered less efficient than men because they were not accustomed to work in the field like men did and had no proper training. Whatever technology, training facility and information on farming was available in the study areas, they were far away from the reach of women labor.

Another significant factor that affects women is the number of adult male members in the family. It means women work more in the field if there is a scarcity of male labor. It was found that due to irregular nature of opportunity of employment and with the hope of getting more wages, men feel comfortable to work in the nonfarm sectors, especially in urban or peri-urban areas. As women cannot leave the rural area for performing several responsibilities, they are the left behind to work in farm sector. The value of adjusted R^2 is 0.734. It indicates that about 73 percent of the variations in the

model can be explained by the explanatory variables considered in this analysis.

Though facing some problems, women rice workers had been able to increase their income through their involvement in rice farming which had a positive impact on their family life. Women's income has a stronger association with children's nutrition than men's. Some of them mentioned that with their increased income, they were buying improved food and dresses for their children, paying for the children's education and purchase medicine for their parents. If the women of a household get the opportunity to earn money, they can utilize this money for those purposes without being dependent on the income earned by their husband. They can involve them in decision making process with their husband regarding family as well as farming. Due to their involvement, they feel more secure and honoured within their family than before. Even they also acquire a place in their community as well. For example, the women become more confident and people seek advice from them regarding their social matters. As it has been mentioned earlier, women in the study areas usually perform post-harvest operations for rice cultivation and work from their home. So they work in a sanitary and safe place. Fertilizer and pesticide application are done by men. So they get a safe working environment. As a result, they are safe from some diseases like skin irritations, gynecological ailments, and other illnesses. Those who work in chemical and industrial factories are suffering from various diseases. Therefore, women who work in agricultural sector are free from these types of problems.

Conclusion and recommendations

In Bangladesh, previously women used to generally played the role of wives and mothers and their activities were confined within the home. They were also bounded by social and religious restrictions. Searching for the way out of poverty, majority of women particularly undertook homestead farming which was not enough to lead a standard of life. Therefore, now a day, they are being engaged to a large extent in farming with a wide range of constraints that limit their performance. As a result of their low economics status, they often miss the opportunity to broadly participate in the society. Therefore, the research was undertaken to determine the contribution of women in farming activities and to find out the development of women due to their involvement in farming, more specifically, rice farming.

Based on the results carried out by this research, most of the women workers were young aged which was considered as working age of adult members. The family sizes of the respondents were comparatively larger than the national average family size in Bangladesh. Most of the respondents were from small farmers' family having an average farm size around 1 acre. Majority of them were undertaking farming as their main occupation followed by very less proportion of population in service or business. Male workers were generally performing the field level work while women were carrying out the post-harvest operations like seedling nursing, weeding, threshing, cleaning and sorting of grain, boiling of grain, drying of straw and rice storing besides doing their household activities.

There was a significant difference between the wages paid to male and female workers. The aggregate average wage rate was BDT 265/man-days for male workers whereas it was BDT 233/day for female. This wage gap varied depending on the types of work and physical strength. The result of the regression model showed that among the 8 variables used in the model, only 3 variables such as distance of rice field from home, the number of available technologies use and the number of available male adult within the family were found affecting the women's decision to work in the field.

Based on the findings of the study, the following recommendations have been formulated:

1) Discrimination in wages of males and females should be reinforced through intervention by the Government and non-Government organizations.
2) Various superstition and negligible attitude towards working women of people need to be changed.
3) Comfortable, healthy and easy working environment should be ensured for women.

4) For easy access and carrying rice from field to farmyard and farmyard to market, rural infrastructures with connecting roads need to be developed.

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