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Participation of Rural Women in Production and Processing Activities of boro Rice Cultivation in Jashore District

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ABSTRACT

Agriculture was introduced in the hand of women. Women's role is confined mostly to processing activities and they are ignored in the case of production activities. The study was conducted to determine the extent of participation in the production and processing activities of boro rice by the rural women in Mangalkot union of Jashsore district of Bangladesh. Data were collected on the participation of rural women in production and processing activities of boro rice cultivation along with their selected characteristics from randomly selected 116 rural women during April -May 2017 by using an interview schedule through personal interview. The majority (63.8%) of the respondents participated in production activities while most (89.7%) of them participated in processing activities of boro rice cultivation to a different extent. But 36.2% and 10.3% of them did not participate in the production and processing activities of boro rice cultivation respectively. The participation of rural women was significantly higher in processing activities than that of production activities (t=0.024**). Among 15 (6 productions + 9 processing) activities, the women participated to the highest extent in cleaning followed by boiling and drying, while it was least in the case of irrigation. Among twelve characteristics of the respondents, only farm size and annual family income showed a significant negative relationship with their extent of participation in production activities while farm size, annual family income, and cosmopoliteness showed similar relationships with participation in processing activities. Besides, organizational participation showed a significant positive relationship with their extent of participation in both production and processing activities. Similar results were also found in the case of overall participation. The participation of rural women should be encouraged in the case of production activities through different motivational activities.

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Introduction

Bangladesh is an agricultural-based and overpopulated country. About 76% of the total population lives in rural areas and 47% of the total manpower is involved in agriculture. In Bangladesh, agriculture contributes 19.3% of the GDP of the country (Bangladesh Finance Bureau, 2014). Among the three types of rice (*Oryza sativa* L.), Boro rice covers about 56.66% of the total rice area, which contributes 43.24% of the total rice production in the country. Rice is intensively cultivated in Bangladesh covering about 80% of arable land (BBS, 2014). Among the Asian countries, Bangladesh is one of the most densely-populated countries in the world having 160 million people with a total area of 1, 43,998 km^2 which is the 6^{th} largest rice producer at the world-scale (BBS, 2014). The total area of the country is 14.86 million ha and the cultivable area is 8.52 million ha. The cropping intensity of the country is 191% (FAO, 2010). Boro is now the major contributor to total rice production in the country, despite Aman's coverage area being greater. *Aus*, *Aman,* and *Boro* rice were recently reported to account for 7%, 38%, and 55%, respectively, of the total rice production in Bangladesh (Risingbd, 2014). In the year 2013–2014, rice production was 34.3 million tons (Bangladesh Finance Bureau, 2014).

According to some historians, women first initiated agricultural practices, demonstrated and developed art and science of farming. Women played a key role in the conservation of basic life support system such as land, water, flora and fauna (Damisa and Yohanna, 2007). The pace of development in any country depends upon the participation and commitment of all the women connected with development activities, especially agricultural production practices, women play significant and crucial role encompassing crop and livestock production, horticulture, pre and post-harvest operations, agro-social forestry and fisheries (Nain and Kumar, 2010; Jaim and Hossain, 2011). Bangladesh, being a traditional Muslim society, women's participation in economic activities in general and in agriculture in particular has remained low. But recent labor force surveys conducted by the Bureau of Statistics show rapidly increasing participation of women in economic activities. The progress is attributed to poverty, empowerment of women by NGOs, and migration of male members from agriculture to non-farm occupation. With the absence of male members, women's role is changing from unpaid family worker to farm managers, a phenomenon termed as "feminization of agriculture". (Hossain and Bayes, 2009; Abdullah and Zeidenstein, 2002).

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 are 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 (Fabiyi *et al.*, 2007) as long as they do not migrate or if they do not get support from other family members.

Until the 1970s, researchers on rural Bangladesh had completely ignored women and their important economic contribution in the national economy. However since the 1980s a plethora of studies have been conducted on women involvement in homestead production (Abdullah, 1983; 1985). Awareness of rice ecosystem for sustainability and food security suffered a lot (Rejula et al , 2017). A large volume of literature on women`s work in rural Bangladesh focuses on women`s involvement in rice processing activities (Abdullah, 1985). Post-harvest (processing) activities include seed selection and preservation, parboiling, drying, winnowing, threshing, etc., and these activities are not only confined to paddy processing work but also all other major crops like wheat, pulses, oilseeds, and spices (Fontana and Paciello, 2009). Many kinds of research have been conducted by researchers regarding the participation of rural women in different IGAs including processing (post-harvest) activities. But there are a few research findings regarding the participation of rural women in the production activities of boro rice cultivation. Considering the point of view the present study was undertaken to identify the extent of participation of rural women in both production and processing activities of boro rice cultivation. In view of the aforesaid discussion, the study focused to determine the extent of participation of rural women in the production and processing activities of Boro rice cultivation and to explore the relationship between the characteristics of the rural women and their extent of participation in the production and processing activities of Boro rice cultivation.

Methodology

The study was based on descriptive and diagnostic research designed (Kothari, 2004). It was designed to study the participation of rural women in production and processing activities of Boro rice cultivation. The study was conducted in two villages namely Panchpota and Mangalkot of Mangalkot Union in Keshabpur Upazila under Jashore District of Bangladesh. All the respondents (the rural women) of selected two villages who were involved in the cultivation of Boro rice constituted the population of the study. The total number of rural women who were involved in Boro rice cultivation was 1164 in Mangalkot (502) and Panchpota (662). About 10% of the rural women were selected at random which constituted the sample size of 116 for the present study.

Data were collected from the respondents (rural women) through personal interviews using an interview schedule from April 02, 2017, to May 09, 2017. The selected characteristics Age, education, farming experience, family type, family size, farm size, income, cosmopoliteness, decision-making capacity, extension contact, organizational participation, and agricultural knowledge of respondents were treated as independent variables of the study. The participation of rural women in the production and processing activities of Boro rice cultivation was considered as the dependent variable. The participation was observed in terms of involvement of the respondents in Boro rice production and processing activities and also from overall context. A number of 15 (production 6 and processing 9) activities were included in the interview schedule. The respondents were asked to rate their extent of participation as frequently, sometimes, rarely and not at all. The scores assigned against each of the rating scales were 3, 2, 1, and 0 respectively. To determine the overall participation score of the respondents, all the scores against selected 15 (production 6 and processing 9) activities were summated. The overall participation score of a respondent could range from 0-45 where '0' indicates no participation and 45 indicate high participation. In a similar way, the participation scores for both production and processing activities were also determined and the scores could range from 0-18 where '0' indicates no participation and 18 indicate high participation, and 0-27 where '0' indicating no participation and 27 indicate high participation respectively. Based on production, processing, and overall participation scores, the respondents were classified into four categories as shown in Table 1.

Table 1. Categories of the respondents according to their participation scores in Boro rice cultivation

Categories	Scores of Participation		
	Production	Processing	Overall
No participation	0	0	0
Low participation	1-6	1-9	1-15
Medium participation	7-12	10-18	16-30
High participation	>12	>18	>30

To determine the extent of participation in the individual activity as well as of typology, a participation index (PI) was calculated using the following formula:

$$\%PI = \text{x } 100$$

To determine PI score (PIS), the following formula was used.

$$PIS = N_f \times 3 + N_s \times 2 + N_r \times 1 + N_n \times 0$$

Where PIS= Participation Index Score, N_f =No. of respondents rated the participation as frequently, N_s = No. of respondents rated the participation as sometimes, N_r = No. of respondents rated the participation as rarely, N_n = No. of respondents not at all participated in any activity

The PI scores could range from 0 – 348 (PI=0-100%) where '0' indicates no participation while '348' indicate highest participation. The collected data were coded, compiled, tabulated and analyzed. The local units were converted into standard units. The qualitative data were transferred into quantitative data by appropriate scoring techniques. Data were analyzed in accordance with objectives of the study. SPSS (Statistical Package for Social Sciences) computer program was used to perform the data analysis. Various statistical measures such as number, percentage, range, mean, standard deviations, and rank order were used to describe the selected characteristics of the respondents of the study area. In order to find out the relationship between the selected characteristics of rural women and their participation, Spearman's Rank-Order Correlation Coefficient (ρ) was computed.

Results and Discussion

Facts on Respondents' Characteristics

In the study area, middle and young aged women were 52.6% and 25.0% respectively, while 22.4% of them were old-aged. Similar findings were reported by Bhuiya (2010). The highest proportion (44.0%) of the respondents maintained nuclear family followed by extended

family (36.2%) and joint family (19.8%). The majority (42.2%) of them had small-sized families compared to large-sized (29.3%) and medium-sized (28.4%) families. The average family size (5.50) of the respondents was less than the national average of 5.6 (BBS, 2012). The majority (58.6%) of the respondents were small farmers followed by marginal (29.3%) and medium (7.8%) farmers and only 0.26% and 0.02% were landless and large farmers. Similar findings were reported by Rahman (2008) and Islam (2002). The highest proportion (48.3%) of the respondents had medium annual income compared to low (36.2%) and high (15.5%) annual income. Similar findings were reported by Hossain and Bayes (2009). Majority (62.1%) of the respondents had low cosmopoliteness followed by medium (37.9%) cosmopoliteness. The majority (62.1%) of the respondents had medium decision-making capacity followed by low (29.3%) and high (8.6%) decision-making capacity. Similar findings were observed by Duflo (2012). Most (79.3%) of the respondents had low extension contact compared to medium (20.7%) extension contact. None of the respondents were found to be contactless and in high contact with different extension media. The highest proportion (43.1%) of the respondents had low organizational participation compared to medium (29.3%) participation. A good percentage (20.7 % and 6.9%) of rural women had no and high organizational participation respectively. Majority (66.3%) of the respondents had medium agricultural knowledge followed by low (18.2%) and high (15.5%) agricultural knowledge (Table 2).

Table 2. Facts on the selected characteristics of the respondents

Character-istics	Category	Score	Respondents (N=116)		Range	Mean	Standard Deviation
			Number	Percentage			
Age (Years)	Young aged	Up to 25	29	25.0	25-62	41.98	9.32
	Middle aged	26-50	61	52.6			
	Old aged	>50	26	22.4			
	Total		116	100.0			
Education (Year of schooling)	Illiterate	0	15	12.9	0-12	5.59	3.99
	Primary	1-5	47	40.5			
	Secondary	6-10	42	36.2			
	Higher secondary	11-12	12	10.3			
	Above Higher secondary	>12	0	0			
	Total	Total	116	100.0			
Farming experience (Score)	Low experience	Upto16	27	23.3	8-43	23.41	9.02
	Medium experience	17-32	64	55.2			
	High experience	>32	25	21.5			
	Total	>4	116	100			
Family type	Nuclear family	1	52	44.0	1-3	1.75	0.76
	Extended family	2	42	36.2			
	Joint family	3	23	19.8			
	Total		116	100			
Family size (Score)	Small	Up to 4	49	42.2	2-13	5.50	2.47
	Medium	5-6	33	28.4			
	Large	>6	34	29.3			
	Total		116	100.0			
Farm size (hectare)	Land less	Up to 0.02	3	0.26	0.02-4.25	0.64	0.74
	Marginal	0.021-0.2	34	29.3			
	Small	0.21-1.0	68	58.6			
	Medium	1.01-3.0	9	7.80			
	Large	>3.0	2	0.02			
	Total		116	100.0			

(Table continued)

(Table continued)

Character-istics	Category	Score	Respondents (N=116)		Range	Mean	Standard Deviation
			Number	Percentage			
Annual income ('000' BDT)	Low income	Up to 100	42	36.2	45-350	135.08	63.43
	Medium income	101-200	56	48.3			
	High income	>200	18	15.5			
	Total		116	100.0			
Cosmopolite-ness (Score)	Low cosmopoliteness	1-8	72	62.1	1-15	7.52	3.69
	Medium cosmopoliteness	9-16	44	37.9			
	High cosmopoliteness	>16	0	0			
	Total		116	100.0			
Decision making capacity (Score)	Low decision making capacity	1-8	34	29.3	1-20	10.66	3.93
	Medium decision making capacity	9-16	72	62.1			
	High decision-making capacity	>16	10	8.6			
	Total		116	100.0			
Extension contact (Score)	Low extension contact	1-13	92	79.3	4-20	9.46	4.14
	Medium extension contact	14-26	24	20.7			
	High extension contact	>26	0	0			
	Total		116	100.0			
Organizational participation (Score)	No participation	0	24	20.7			
	Low participation	1-3	50	43.1			
	Medium participation	4-6	34	29.3			
	High participation	>6	8	6.9			
	Total		38	100.0			
Agricultural knowledge (Score)	Low agricultural knowledge	Up to 10	21	18.2	8.25-21	13.9	3.39
	Medium agricultural knowledge	10-20	77	66.3			
	High agricultural knowledge	>20	18	15.5			
	Total	>4	116	100.0			

Participation of Rural Women in Boro Rice Cultivation

The participation of rural women was observed as participation in Boro rice production and processing activities along with overall participation. The distribution of rural women according to their extent of participation in activities related to Boro rice cultivation is shown in Table 3. The majority (63.8%) of the respondents had low to high participation in production activities while most (89.7%) of them had low to high participation in processing activities. Only one-third (36.2%) and one-tenth (10.3%) of them had no participation in the production and processing activities of Boro rice cultivation. From the overall context, the highest proportion (45.6%) of them had medium participation in Boro rice cultivation followed by low participation (31.8%) and high participation (12.3%). There was one-tenth (10.3%) of the respondents who had no participation in overall activities of Boro rice cultivation. But Islam et al (2018) found that none of the respondents belonged to the no participation category regarding the participation of women in vegetable cultivation. On the other hand, Ahmed et al (2008) found that none of the women had high participation and one-twentieth of them had no participation in income-generating activities (IGAs).

Activities Participated by the Rural Women in Boro Rice Cultivation

In the study area, it was found that a good percentage of the respondents were trying to involve them in production and processing activities of Boro rice cultivation to utilize their time for livelihood maintenance. In past years, they

were not aware of this participation aspect but nowadays they are involving them in the production and processing activities of Boro rice cultivation. In order to rank/compare participation status in 15 (production-6 and processing-9) activities of Boro rice cultivation, a Participation Index (PI) was calculated (Table 5).

Data presented in the Table 4 indicate that, the rural women participated highly in processing activities ($\bar{X}$= 176.8) than that of production activities ($\bar{X}$= 81.83) and the participation of rural women in production activities differed significantly from that of processing activities (t= 0.024**). It means that the women are still less interested to participate in production activities. This might due to that the Porda Protha or social obstacles hinder their participation in production activities. Highest level of participation was observed in cleaning

Table 3. Distribution of the respondents according to their extent of participation in boro rice cultivation

Activities	Category	Score (Years)	Respondents (N=116)		Range	Mean	SD*
			Number	Percent			
Participation in Production Activities	No participation	0	42	36.2	0-14	4.19	4.23
	Low participation	1-6	38	32.8			
	Medium participation	7-12	30	25.9			
	High participation	>12	6	5.1			
Participation in Processing	No participation	0	12	10.3	0-27	13.91	7.30
	Low participation	1-9	26	22.4			
	Medium participation	10-18	50	43.1			
	High participation	>18	28	24.2			
Overall Participation	No participation	0	12	10.3	0-40	18.12	10.65
	Low participation	1-15	37	31.8			
	Medium participation	16-30	53	45.6			
	High participation	>30	14	12.3			

*SD= Standard Deviation

Table 4. Rank order of activities of Boro rice cultivation based on participation index (PI)

Sl. No.	Type of participation	PI		Rank
		Scores	Percent	
	Participation in production activities	**$\bar{X}$= 81.83**	**23.51**	**2th**
A.	1.Land preparation	143	41.00	7th
	2.Fertilization	27	07.75	**14th**
	3.Irrigation	7	02.01	15th
	4.Sowing	73	20.98	11 th
	5.Transplanting	125	35.92	9th
	6. Weeding	116	33.33	10th
	Participation in processing activities	**$\bar{X}$= 176.8**	**50.80**	**1st**
B.	7.Harvesting	46	13.22	12th
	8.Transportation	28	08.05	13th
	9.Threshing	204	58.62	5th
	10.Winnowing	233	66.95	4th
	11.Cleaning	256	73.56	1st
	12.Boiling	254	72.93	2nd
	13.Drying	252	72.41	3rd
	14.Bagging	181	52.01	6th
	15.Storing	138	39.66	8th

(PI=256; 73.56%) followed by boiling, drying and so ones (Table 5) while it was least in case of irrigation (PI=7; 02.01%). But Islam et al (2018) observed that the rural women participation was highest in seedbed preparation and seedling raising while it was least in case of intercultural operation. Ahmed et al (2008) conducted a study on participation of women in income generating activities under ASA at Dumuria upazila of Khulna district. They found that the participation of women was dominant in layering, seasonal vegetable cultivation, rice cum fish culture while it was less in broiler and beef rearing, making Panjabi, grocer shop keeping, raw material business, and sewing three-piece.

Relationships between selected characteristics and extent of participation

This section deals with the findings of the relationships between the independent variables (the selected characteristics of the respondents) and the dependent variable (participation) of the study. Spearman's Rank-Order Correlation Coefficient (ρ) was used for exploring the relationships between two variables. The results of the correlation between the independent and dependent variables have been shown in Table 5. Among 12 selected characteristics of the respondents, farm size and annual income showed significant negative relationships with their participation in both production and processing as well as overall activities related to Boro rice cultivation. Besides, cosmopoliteness and agricultural knowledge also have negative significant relationship with participation of the respondents in processing & overall and production activities respectively while only education depicted the negative significant relationship with participation in production activities of Boro rice cultivation. It means that the higher are farm size, annual income and cosmopoliteness are lower are the participation in processing activities. It means that the women with higher size farm, annual income and cosmopoliteness are less interested in participation in processing activities. This might be due to that these categories of respondents are solvent and probably they hire labour for activities related to Boro rice cultivation. These findings have similarities with the findings of Islam (2002) but Haque and Itohara (2008) and Rahman (2008), Singh et al (2011) found non-similar result. However, organizational participation showed a positive significant relationship with the participation of the respondents in both production and overall activities related to Boro rice cultivation. It implies that the women who are engaged in social organizations have less time to be involved in activities of Boro rice cultivation

Conclusion

A similar trend was observed in the case of overall participation of rural women and participation by them in

Table 5. Relationships between selected characteristics of the respondents and their extent of participation in activities related to Boro rice cultivation

Sl. No.	Independent variable (selected characteristics)	Dependent variable (focus variable)	Co-efficient of correlation (Computed 'ρ') values		
			Production activities	Processing activities	Overall activities
1	Age	Extent of Participation in activities related to boro rice cultivation	0.135NS	-0.027NS	0.035NS
2	Education		-0.202*	-0.038NS	- 0.106NS
3	Farming Experience		0.082NS	-0.070NS	-0.016NS
4	Family type		0.061NS	0.024NS	0.041NS
5	Family size		0.146NS	0.048NS	0.091NS
6	Farm size		-0.493**	-0.553**	-0.574**
7	Annual income		-0.632**	-0.753**	-0.767**
8	Cosmopoliteness		-0.152NS	-0.197*	-0.195*
9	Organizational participation		0.197*	-0.027NS	0.291**
10	Decision-making capacity		0.008NS	-0.038NS	-0.038NS
11	Extension contact		0.135NS	-0.070NS	-0.103NS
12	Agricultural knowledge		-0.202*	0.024NS	0.074NS

NS= Non-significant, ** Correlation is significant at the 0.01 level (2-tailed), * Correlation is significant at the 0.05 level (2-tailed)

processing activities. The rural women's participation in processing activities was higher than that of production activities and it differed significantly. A small portion (5.1% and 24.2%) of the women had high participation in production and processing activities in Boro rice cultivation respectively. Hence, there is scope to increase their participation. Attempts may, therefore, be made to increase the participation of the rural women in production and processing activities in Boro rice cultivation, especially in production activities.

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