



Participation of Rural Women in Rice Farming Activities: Case of a Village in Bangladesh

**Kakon Chakma¹, Umama Begum Ruba^{1*}, Jarrin Yeasmin Senth¹
and Saidur Rahman¹**

¹*Faculty of Agriculture, Sylhet Agricultural University, Sylhet, Bangladesh.*

Authors' contributions

The work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/ARJA/2021/v14i230119

Editor(s):

(1) Dr. M. Yuvaraj, Adhiparasakthi Agricultural College, India.

Reviewers:

(1) Ajakaiye Olabisi Olabode, Yaba College Of Technology, Nigeria.

(2) Ingrid Gaby Melgarejo Pomar , Universidad Mayor de San Andrés- School of Medicine, Bolivia.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/66859>

Original Research Article

Received 14 January 2021
Accepted 22 March 2021
Published 27 March 2021

ABSTRACT

The objectives of this research were to evaluate the socio-economic features of rural women, determine their participation extent in rice farming activities, and find out relationship between socio-economic features and extent of participation. This survey-based research was conducted in a village called Jahidpur in the Sunamganj district. 80 farm families involved in rice farming were selected by using simple random sampling method. Data were collected from women respondents through direct interviews using questionnaires. To determine participation extent, a rating scale of 5 points was used. Around 22 tasks were categorized into 5 aspects namely pre-planting, planting, intercultural operation, harvesting, and post-harvesting. The report revealed that rural women's participation was maximum in post-harvesting activities. However, no participation was found in some field-level tasks such as seedbed preparation, transplanting, nutrient management, plant protection management, irrigation, and harvesting. A major part of the rural women had medium level participation in rice farming activities 61.25% compared to a low participation rate of 38.75% but nobody had high level participation. Some socio-economic characteristics such as age, farming experience, agricultural knowledge had a significant positive relationship whereas education had a significant negative relationship with rural women's participation in rice farming activities. Tradition (100%), food security (95%), and poverty reduction (92.5%) were the main three reasons for women's participation while male-dominated society (100%), restricted social interaction (95%), and

*Corresponding author: E-mail: umamaruba909@gmail.com;

limited access to resources (86.5%) acted as top three barriers. Rural women's involvement in rice farming was not at a satisfactory level and proper strategy implementation is required for further increasing the participation extent in rice farming activities.

Keywords: Rural women; women participation; rice farming; Bangladesh.

1. INTRODUCTION

Economically Bangladesh is one of South Asia's fastest-growing nations where the agriculture sector plays a crucial role in the nation's sustainable development. The contribution of the agriculture sector to the country's GDP is constantly increasing and now this sector contribution in GDP is around 3223938 million TK which comprises around 13.32% of the total GDP [1]. Climatic suitability, physiographic condition, and fertile soil have enabled the production of crops throughout the season which empowers overall agricultural growth. Three cropping seasons and thirty agro-ecological zones are efficient in the production of diversified crops that make the agricultural production up to the expectation mark which helps to ensure food security, economic stability. The contribution of the agriculture sector in poverty reduction was observed from 2005 to 2010 and it was almost reduced by 90% [2].

Rice, wheat, jute, and potato are major field crops in Bangladesh where rice is cultivated as the main crop. Rice is always considered as a primary staple food that provides 48% of rural employment, about two-thirds of the overall supply of calories, and about half of the average person's total protein intake within the country [3]. Rice occupies around 74% of the total cropped area, which accounts for 50% of Bangladesh's agricultural GDP and a sixth of its national income [3].

In Bangladesh, half of the population is female and the increase of women's participation has a significant impact on the country's economic prosperity and development. Women's labor force participation accounts for nearly 20% of the total GDP and their participation rate grew from 24.73% in 1990 to 36.41% in 2020 [4]. Women's empowerment mostly depends on different kinds of social factors. Usually, rural women's working habits are marked by change and continuity, also flexibility, and rigidity [5]. However, most of their contribution remains unseen, invisible and unrecognized, and considered as household work [6]. Women's unrecognized unpaid work

monetary value was almost 40% of Bangladesh's GDP fiscal 2016-2017 [7]. The male-dominated profoundly entrenched socio-cultural structure, religious bigotry in rural areas have largely restricted women's participation. Women have limited access to resources and don't possess control over resources like land, capital, input, technology, training, and marketing facilities [8]. Social norms are changing due to extreme poverty and food crises, as consequence women are also emerging in the field as well [9]. Active participation allows women to be confident in conveying their views and opinions that they can get access to resources like land, credit, and finally decision making. To ensure women's empowerment, it is needed to address their participation, right to the asset.

As an agro-based country, rural women of Bangladesh are mainly involved in different agricultural activities alongside household maintenance. Rural women of Bangladesh are traditionally involved in the post-harvest processing of rice. Usually, they play supporting roles in rice farming to male members. Rice farming requires intensive labor and women's participation acts as labor from their own family [10]. Women's participation helps to sustain crop production that ensures food and financial security for a family. Women's empowerment in rural communities through agricultural activities could be strengthened by eliminating barriers they face during performing their activities. Empowering women through income-generating activities would eliminate social constraints. In the future, local agrobiodiversity and food security could be ensured by active participation and role-playing by women [11].

Women's participation in rice production is always an important topic of research since the creation of Bangladesh [10,12-14]. Bangladesh's agriculture sector has been changed a lot because of climate change, population pressure, reduction of land, rapid urbanization, and Industrialization. Now, this sector is going through a process of modernization. Technological change affected women's participation in crop production [15]. So it is needed to explore the current status of women's

participation in different activities of rice production, with a specific emphasis on rural places which have utmost importance to achieve Sustainable Development Goals such as gender equality, no poverty, zero hunger. Considering the importance, an investigation was carried in a rural village of Bangladesh with the following objectives:

1. To evaluate the socio-economic features of rural women.
2. To determine rural women's participation extent in rice farming activities.
3. To find out the relationship between some selected attributes of rural women with their participation in rice farming activities.

2. METHODOLOGY

This survey-based research was conducted in a rural village of Bangladesh namely Jahidpur which is situated in the Sunamganj district. This village is far away from the city and village people were mostly engaged with rice farming. Out of a total 450 farm families (Source: Upazila statistics group), 80 rural farm families involved in rice farming were selected by using simple random sampling method. The information was collected using an interview questionnaire. Data were taken from one woman from each family by the authors themselves through direct interviews. Interviews were taken in the daytime when the majority of male members were not at home. Appropriate scale and measurement techniques were followed to fulfill study objectives. To measure the participation extent, rice farming activities were categorized into five aspects namely pre planting, planting, intercultural operation, harvesting, and post-harvest. Data were collected by using a 5 points rating type scale. For each response score was given the following way (0=never, 1=rarely, 2=often, 3=sometimes, 4=always). Participation score of women in rice production measured by the following formula:

$$PS = (Na \times 4) + (No \times 3) + (Ns \times 2) + (Nr \times 1) + (Nn \times 0)$$

Where,

- PS= Participation Score
- Na= Respondents participated to always extent
- No= Respondents participated to often extent
- Ns= Respondents participated to sometimes extent
- Nr= Respondents participated to rarely extent
- Nn= Respondents participated never extent

Collected data were analyzed by using SPSS and Microsoft excel through various statistical measures such as frequency count, percentage, mean and standard deviation. To find out the potential relationship between selected attributes of respondents and their participation in rice farming activities, Pearson's Correlation Coefficient (r) was used. Five percent and One percent levels of probability were used as the basis of rejecting or accepting null hypotheses.

3. RESULTS AND DISCUSSION

3.1 Socio-economic Attributes of Rural Women

Socio-economic characters are a significant parameter in measuring participation in agricultural activities. Table 1, Fig. 1. Presented some socio-economic attributes of women such as age, marital status, education, family size, farm size, farm ownership, farming experience, organizational participation, cosmopolites, sources of information, sources of capital, agricultural knowledge, and annual farm income.

The major part around 40% of female respondents was young (age below 30) while 37.5% were middle-aged (age between 30 to 45) and only 22.5% of respondents were old (age above 45). That indicated young to middle-aged women were more involved in rice production activities. The mean of the respondent's age was 33.37 with a standard deviation of 14.07. The major part of rural women around 68.75% were married and 31.25% were unmarried. Rural married women were more engaged in performing agricultural activities than unmarried women because of social position and responsibilities.

Education helps to enlighten the knowledge and mindset that makes a person more capable of decision-making. The table depicts that 33.75% of female respondents had no formal education (0). Meanwhile, 23.75% received primary education (1-5), and the portion of respondents who received secondary (6-10) and tertiary education (10<) was 33.75% and 8.75% respectively. It was observed that mean of the respondent's educational level was 5.36 with a standard deviation of 4.47. That indicated, less educated rural women were much involved in rice production activities.

Around 76.25% of farm families were single type and 23.75% of respondents belonged to a joint

family. It is depicted that 72.5% of women had a mid-size family (members between 5 to 9) whereas 18.75% of respondents belonged to the small family category (members below 4) and only 8.75% of respondents were from a large family (members above 9). Department of Agricultural Extension (1999) suggested classification was used to categorize farm size: Marginal (0.2 and below), Small (0.20 to 1), Medium (1.01 to 3), and Large (above 3). 75% of overall respondents had small farms, 21.25% of respondents had medium, 3.75% had large farms and no respondents were found in the marginal farm size category. The mean of the respondent's farm size was 0.79 with a standard deviation of 0.64. The farming experience of female respondents was categorized into Low (below 5 years), medium (between 5 to 15), and high (above 15). 40% of respondents possessed farming experience of more than 15 years which is splendid higher farming experience. Rural women believe that experience increases their flexibility in performing tasks conveniently and smoothly. 36.25% of respondents had medium farming experience and 23.75% of respondents had low experience. The mean of their farming experience was 13.87 with a standard deviation of 10.53. Only 1.25% had training experience where 98.75% received no training experience. The mean of the training experience was 0.0125 with a 0.111 standard deviation. It was quite evident that 98.75% of female respondents were not involved with any organization while 1.25% of respondents were engaged with organizations. The mean score of organizational participation was 0.0125 with a standard deviation of 0.111. Organizational participation is required to enhance communication and deal with social circumstances. But women of rural area's movements are limited and their participation is often not appreciated. 98.75% of female respondents were under the low cosmopolitanism category and only 1.25% had medium cosmopolitanism. No respondents had experienced high cosmopolitanism. The mean of cosmopolitanism was 2.6 with a standard deviation of 1.68. Around 71.25% of respondents obtained information from neighbors while 27.5% of respondents got the opportunity to receive information from Department of Agricultural Extension (DAE). Only 1.25% of respondents obtained information through mobile. 81.25% of respondents established their farming through personal capital and 18.75% supported Loans. Their loan credit was insufficient to meet overall expenses, they somehow managed or failed to

establish their farming through self-capital. The income of rural women increases due to credit access and credit availability [16]. Due to limited accessibility in production resources such as land, capital, technology, marketing, and infrastructure women are less likely to be motivated [17]. 52.5% of respondents had sufficient agricultural knowledge (between 4 to 6). When 38.75% were experts as they had a high score (above 6), only 8.75% possessed little agricultural knowledge (below 4). The mean agricultural knowledge level was 5.78 with a 1.68 standard deviation. Around 61.25% of farm families had a medium level of annual farm income (Between 50000-150000 taka). Only 16.25% had a high level of annual farm income (above 150000 takas). Around 22.5% had low annual farm income (below 50000 takas). The mean of farm income remained 100062.5 with a 110541.1 standard deviation. Rural farm families adopted Hybrid varieties of rice. The cultivated rice varieties of the study area were BRR1 Dhan-28, BRR1 Dhan-29, Janakraj, Heera, and Manik.

3.2 Rural Women Participation Extent in Rice Farming

Rural women's participation score has an observed range of 8 to 51 compared with a possible range of 0 to 88. The mean participation score 31.71 and 12.35 standard deviation. Table-2 Presented the large portion of rural women (61.25%) had a mid-level of participation and (38.75%) had low levels of participation. No respondent was found with "no participation" and "high level of participation".

3.3 Comparative Participation of Rural Women in Rice Farming Activities

To find out the comparative participation, rice farming tasks were categorized into 5 aspects which include 22 tasks. The first aspect was pre planting which included site selection, crop or variety selection, seed treatment, seedbed preparation, seedling raising, and transplantation. The second aspect was planting and the third aspect was intercultural operations which included weeding, nutrient management, irrigation, and plant protection management. The fourth aspect was harvesting and the final aspect was post-harvesting which included threshing, winnowing, cleaning, drying, bagging, carrying, sorting, milling, storing, selling, and income management.

Table 1. Distribution of rural women according to socio-economic attributes

Character	Category	Rural Women		Mean	SD
		Number	Percent		
Age (Years)	Young (below 30)	32	40	33.37	14.07
	Middle (30 to 45)	30	37.5		
	Old (above 45)	18	22.5		
Education	No formal education (0)	27	33.75	5.36	4.47
	Primary (1 to 5)	19	23.75		
	Secondary (6-10)	27	33.75		
	Tertiary (above 10)	7	8.75		
Family size (No.)	Small (below 5)	15	18.75	6.27	2.3
	Medium (5 to 9)	58	72.5		
	Large (above 9)	7	8.75		
Farm size (Ha)	Marginal (below 0.20)	0	0	0.79	0.64
	Small (0.20 to 1.00)	60	75		
	Medium (1.01 to 3)	17	21.25		
	Large (above 3)	3	3.75		
Farming experience (Years)	Low (below 5)	19	23.75	13.87	10.53
	Medium (5 to 15)	29	36.25		
	High (above 15)	32	40		
Training Experience (Days)	No (0)	79	98.75	0.0125	0.111
	Low (1-3)	1	1.25		
	Medium (4<)	0	0		
Organizational Participation (Number)	No (0)	79	98.75	0.0125	0.111
	Low (1-3)	1	1.25		
	Medium(3<)	0	0		
Cosmopolitanism (score)	Low (below 8)	79	98.75	2.6	1.68
	Medium (8 to 16)	1	1.25		
	High(above 16)	0	0		
Agricultural Knowledge Level (score)	Little (below 4)	7	8.75	5.78	1.68
	Sufficient (4 to 6)	42	52.5		
	Expert (above 6)	31	38.75		
Annual Farm Income (Taka)	Low (Below 50,000)	18	22.5	100062.5	110541.1
	Medium (50,000 to 1,50,000)	49	61.25		
	High (above 1,50,000)	13	16.25		

Source: Field survey,2021

Table 3. Comparative participation of rural women in different tasks of rice farming

Aspects	Tasks	Always	Often	Sometimes	Rarely	Never	PS	Rank (22 tasks)	Mean of aspect	Rank (5 aspect)
A. Pre planting	Site Selection	8	34	6	1	31	147	9 th	98	2 nd
	Crop/Variety Selection	7	32	8	3	30	143	10 th		
	Seed Treatment	33	20	1	5	21	199	8 th		
	Seedbed Preparation	0	0	0	0	80	0			
	Seedling Raising	0	0	0	1	79	1	16 th		
B. Planting	Transplanting	0	0	0	0	80	0		0	
C. Intercultural Operations	Weeding	0	0	1	8	71	10	15 th	2.5	3 rd
	Nutrient Management	0	0	0	0	80	0			
	Irrigation	0	0	0	0	80	0			
	Plant protection management	0	0	0	0	80	0			
D. Harvesting	Harvesting	0	0	0	0	80	0		0	
E. Post-harvesting	Threshing	0	0	0	17	63	17	13 th	185.18	1 st
	Winnowing	41	23	10	0	6	253	4 th		
	Cleaning	47	18	14	1	0	271	1 st		
	Drying	45	18	16	1	0	267	2 nd		
	Bagging	42	15	15	7	1	250	5 th		
	Carrying	6	6	26	23	19	117	12 th		
	Sorting	42	10	11	3	14	223	7 th		
	Milling	2	1	2	1	74	16	14 th		
	Storing	50	15	7	0	8	259	3 rd		
	Selling	13	22	4	4	37	130	11 th		
Income Management	28	26	20	4	2	234	6 th			

Source: Field Survey, 2021

Table 2. Distribution of rural women based on Participation score in rice farming

Participation Extent	Distribution of respondents			Mean	SD
	Observed Range	Number	Percent		
No Participation(0)	8-51	0	0	31.71	12.35
Low (Up to 29)		31	38.75		
Medium (30 to 58)		49	61.25		
High (above 58)		0	0		

Source: Field survey, 2021

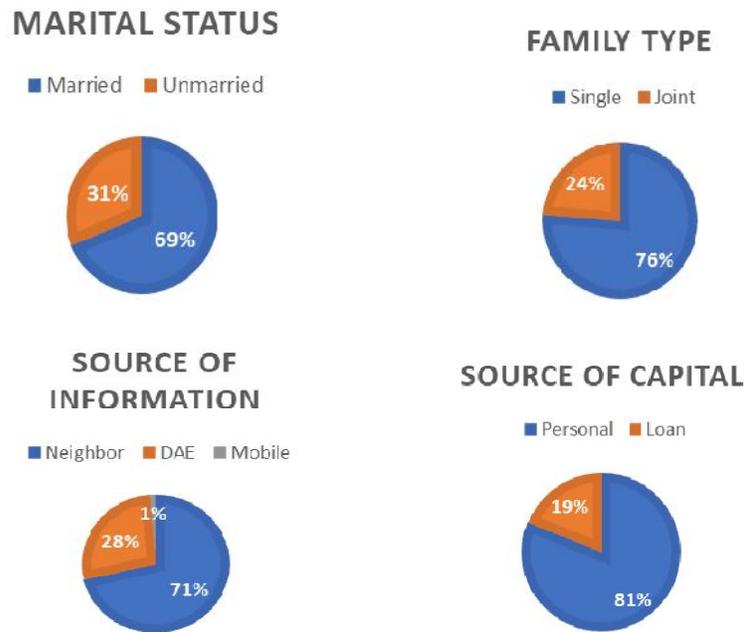


Fig. 1. Distribution of respondents according to marital status, family type, sources of information, and sources of capital

Table 3 depicted that rural women participation was ranked 1st with the highest PS mean score of 185.18 in the aspect of Post-harvesting. The other aspect Pre planting ranked 2nd with a PS mean score of 98 and Intercultural operation ranked 3rd with a PS mean score of 2.5. No participation was found in two aspects namely planting and harvesting. Based on participation score, tasks namely cleaning (PS=271), drying (PS=267), storing(PS=259), winnowing (PS=253, bagging (PS=250) were ranked 1st to 5th respectively, and so on. Whereas no participation was found in some tasks namely seedbed preparation, transplanting, nutrient management, irrigation, plant protection management, and harvesting. The major part believed that pre-harvesting tasks were labor-intensive and those were only men’s work. Also, male members didn’t allow women to work at the field level.

Their works were limited in those tasks that could be done at home. As a consequence, rural women’s participation score was very low in pre-harvesting tasks. Sanzidur Rahman [18] reported, “women have active participation only in post-harvesting activities”.

3.4 Relationship between Selected Attributes and their Extent of Participation in Rice Farming

Pearson’s correlation coefficient test was used to explore the potential relationship between selected attributes with their participation extent in rice farming activities. Table 4 Presented Ten social attributes (Independent variable) and participation extent (Dependent variable) of rural women. The study found that age, farming

experience, agricultural knowledge had positive significant relationships and education had a negative significant correlation with their participation.

The rural women's age had a major positive correlation with their participation in rice farming [19]. As women are engaged in farm management, especially in decision-making, participation increases with the increase in age [20]. Younger women perform generative tasks, and older women are intended to perform household roles along with decision-making in their household activities [21]. Also, rural women's farming experience had a significant positive correlation with participation in rice farming activities [22]. Women who had higher farm experience were more involved in crop production activities. Agricultural knowledge had a positive relationship with the attitude towards the participation of respective activities [23].

However, education had a negative correlation with rural women's participation in rice farming activities [24]. Saha [25] reported that education level is negatively correlated with involvement in agricultural activities and educated youth are less likely to be engaged in agricultural activities. With the increase of educational level, women have a high tendency to be engaged in non-agricultural employment, meanwhile, the participation of women tends to diminish [26]. Family size, farm size, training experience, organizational participation, cosmopolitanism, annual farm income were not significant determining factors of women's participation in jahidpur.

3.5 Reasons for Rural Women Participation in Rice Farming

The main reasons Table 5 behind rural women performed in rice farming were tradition (100%), food security (95%), poverty reduction (92.5%), saving money (86.25%), and reducing the gender gap (53.75%). They gained rice cultivation knowledge through family and they have been performing rice farming activities from generation to generation. Besides the tradition, rice was the main crop for consumption and also the primary income source. Consumption and family income mostly depend on rice which helped to mitigate their poverty as well as food insecurity. Women participated in rice farming to diminish the labor cost that helped them to save money. Also, participation in monetary activities enables empowerment that reduces the gender gap.

3.6 Barriers to Rural Women Participation in Rice Farming

Table 5 All the respondents (100%) identified male-dominated society as the main barrier to participation. Meanwhile, restricted social interaction (95%) also a barrier as their mobility outside their household boundary was very limited. They had limited access to resources (86.25%) such as land, capital, credit. Lack of ownership on assets (81.25%), lack of economic empowerment (75%), lack of technical knowledge (72.5%), lack of decision-making power (66.25%) were also major barriers to rural women's participation.



Fig. 2. Typical rural women in Bangladesh

Table 4. Relationship between selected attributes and their participation in rice farming

Dependent Variable	Independent Variable	Correlation Coefficient
Women Participation in rice farming	Age	.641**
	Education	-.551**
	Family size	-.081 ^{NS}
	Farm Size	.123 ^{NS}
	Farming experience	.562**
	Training experience	.149 ^{NS}
	Organizational participation	.149 ^{NS}
	Cosmopolitanism	.213 ^{NS}
	Agricultural Knowledge	.454**
Annual farm income	.186 ^{NS}	

**Significant at 0.01 level (2 tailed), *Significant at 0.05 level (2 tailed), ^{NS}Not significant

Table 5. Ranking of reasons given by rural women

Reasons	Number	Percent	Rank
Tradition	80	100	1 st
Poverty reduction	74	92.5	3 rd
Food security	76	95	2 nd
Save money	69	86.25	4 th
Reduce gender gap	43	53.75	5 th

Source: Field survey, 2021

Table 6. Ranking of Barriers given by rural women

Barriers	Number	Percent	Rank
Male dominated society	80	100	1 st
Restricted social interaction	76	95	2 nd
Limited access to resources	69	86.25	3 rd
Lack of economic empowerment	60	75	5 th
Lack of decision making power	53	66.25	7 th
Lack of ownership to asset	65	81.25	4 th
Lack of technical knowledge	58	72.5	6 th

Source: Field survey, 2021

4. CONCLUSION

The conducted research revealed that the major portion of the rural women was married, young aged with a basic education level. They belonged to single-type middle-size families having small farms with a mid-level of annual income where they invested from personal capital. They had high experience in farming with sufficient agricultural knowledge. But they had low mobility with no experience in training and organizational participation. Usually, they got agricultural information from neighbors. The extent of rural women's participation remained medium (61.25%) and their participation was maximum in post-harvesting activities (PS=185.18). However, no participation was found in some field-level tasks such as seedbed preparation, transplanting, nutrient management, plant protection management, irrigation, and harvesting. The hypothesis revealed that age,

farming experience, agricultural knowledge shared a significant positive relationship with rural women's participation in rice farming activities while education shared significant negative relationship. Tradition (100%), food security (95%), poverty reduction (92.5%), saving money (86.25%), and reducing the gender gap (53.75%) were the main reasons for rural women's participation in rice farming. But male-dominated society (100%), restricted social interaction (95%), limited access to resources (86.25%), lack of ownership to assets (81.25%), lack of economic empowerment (75%), lack of technical knowledge (72.5%), lack of decision making power (66.25%) acted as the major barriers to rural women's participation in rice farming. Participation extent of rural women in rice farming activities was not satisfactory. So, appropriate strategies should be applied to enhance women's participation.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. BBS. Bangladesh Bureau of Statistics. Statistical Year Book of Bangladesh. Statistics and Informatics Division (SID), Ministry of Planning, Government of the People's Republic of Bangladesh, Dhaka; 2019.
2. Bangladesh Continues to Reduce Poverty But at Slower Pace, World Bank; 2017. Accessed 11 February 2021. Available: <https://www.worldbank.org/en/news/feature/2017/10/24/bangladesh-continues-to-reduce-poverty-but-at-slower-pace>
3. BBS. Bangladesh Bureau of Statistics. 45 years Agriculture Statistics of Major Crops, Statistics and Informatics Division (SID), Ministry of Planning, Government of the People's Republic of Bangladesh; 2018.
4. Labor force participation rate, female (% of female population ages 15+) (modeled ILO estimate)-Bangladesh | Data, World Bank; 2020. Accessed 11 February 2021. Available: <https://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS?locations=BD>
5. Gurung JD. Searching for Women's voices in the Hindu-Kush Himalayas, International center for integrated mountain development, Kathmandu. 1999;1-36,
6. Anam S. Women's work: Unrecognised and undervalued | The Daily Star, The Daily Star; 2016. Accessed 11 February 2021. Available: <https://www.thedailystar.net/supplements/25th-anniversary-special-part-4/womens-work-unrecognised-and-undervalued-212014>
7. Women's unpaid work equivalent to 40pc of GDP: Sanem. The Daily Star; 2019. Accessed 11 February 2021. Available: <https://www.thedailystar.net/business/news/womens-unpaid-work-equivalent-40pc-gdp-sanem-1823374>
8. Fletschner D, Kenney L. Rural women's access to financial services: credit, savings, and insurance, Gender in agriculture. 2014;187-208. Available: http://dx.doi.org/10.1007/978-94-017-8616-4_8
9. Shirin M, Ahmed U, Miah MAH. Achievements of women in mixed farming, Success stories of women in agriculture: proceeding of a national workshop on case studies, Bangladesh Agricultural Research Council (BARC), Dhaka; 1995.
10. Rasheed A, Mwalupaso GE, Abbas Q, Tian X, Waseem R. Women Participation: A Productivity Strategy in Rice Production, Sustainability. 2020;12;7:2870. Available: <https://doi.org/10.3390/su12072870>
11. Sachs CE. Gendered fields: Rural women, agriculture, and environment. Routledge; 2018. Available: <https://doi.org/10.4324/9780429493805>
12. Begum S. 13 Women and technology: rice processing in Bangladesh, in Women in Rice Farming: Proceedings of a Conference on Women in Rice Farming Systems, the International Rice Research Institute, PO Box 933, Manila, Philippines, 26-30 September. 1983;221. Available: http://books.irri.org/0566051052_content.pdf
13. Jahan M, Sarker JR. Gender participation on rice post-harvest activities in Bangladesh, Journal of Environmental Science and Natural Resources. 2015;8;1: 45-50. Available: <https://doi.org/10.3329/jesnr.v8i1.24670>
14. Rahman F, Shammi SA, Parvin MT, Akter N, Khan MS, Haque S. Contribution of rural women to rice production activities in two different areas of Bangladesh," Progressive Agriculture. 2016;27;2:180-188,. Available: <https://doi.org/10.3329/pa.v27i2.29329>
15. Rahman S, Routray JK. Technological change and women's participation in crop production in Bangladesh, Gender, Technology and Development. 1998;2;2: 243-267. Available: <https://doi.org/10.1177/097185249800200204>
16. Begum SA. Influence of BRAC credit program of socioeconomic development of rural women. A study of five villages of Jamalpur district, Unnayaon Bitarka. 1995;14;3:29-47,
17. Amin H, Ali T, Ahmad M, Zafar MI. Participation level of rural women in agricultural activities. Pak. J. Agri. Sci. 2009;46;4:294-301. Available: <https://www.pakjas.com.pk/papers/83.pdf>

18. Rahman S. Women's employment in Bangladesh agriculture: Composition, determinants and scope. *Journal of Rural Studies*. 2000;16;4:497–507. Available: [https://doi.org/10.1016/S0743-0167\(00\)00006-1](https://doi.org/10.1016/S0743-0167(00)00006-1)
19. Akanda W. Participation of rural women in different farm and non-farm activities in two selected villages of Mymensingh district. M S. Thesis, Dept. Agril. Extn. Edu, Bangladesh Agricultural University, Mymensingh; 1994.
20. Damisa MA, Yohanna M. Role of rural women in farm management decision making process: Ordered probit analysis, *World Journal of Agricultural Sciences*. 2007;3;4:543–546. DOI: 10.3923/tasr.2007.241.245
21. Dickerson-Putman J. Age and gender stratification in the Highlands of Papua New Guinea: implications for participation in economic development. *Human Organization*. 1992;51;2:109–121. Available: <https://www.jstor.org/stable/44126717>
22. Zahoor A, Fakher A, Ali S, Sarwar F. Participation of rural women in crop and livestock activities: a case study of tehsil Tounsa Sharif of southern Punjab (Pakistan), *Int. J. Adv. Res. Manage. Soc. Sci.* 2013;2;12:98–121. Available: <https://garph.co.uk/IJARMSS/Dec2013/9.pdf>
23. Ali O. Attitude of Rural Women of Bangladesh Agricultural University Extension Centre (BAUEC) towards Working in Group, MS (Ag. Ext. Ed.) Thesis; 1995.
24. Farid KS, Mozumdar L, Kabir MS, Goswami UK. Nature and extent of rural women's participation in agricultural and non-agricultural activities, *Agricultural Science Digest*. 2009;29;4:254–259. Available: <https://arccjournals.com/journal/agricultural-science-digest/ARCC2188>
25. Saha NK. Participation of Rural Youth in Selected Agricultural Activities in the Villages of Muktagacha Thana Under Mymensingh District, MS (Ag. Ext. Ed.) Thesis, Dept. of Agril Extension Education, Bangladesh Agricultural University; 1997.
26. Harun ME. Women's workload and their role in agricultural production in Ambo district, Ethiopia, *Journal of development and agricultural economics*. 2014;6;8:356–362. DOI: 10.5897/JDAE2013.0546

© 2021 Chakma et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/66859>