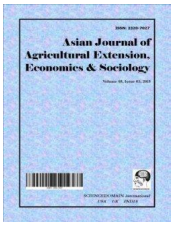


Asian Journal of Agricultural Extension, Economics & Sociology

33(3): 1-14, 2019; Article no.AJAEES.49421
ISSN: 2320-7027

Participation of Rural Women in Organic Farming

Nahida Yasmin Nishi[1], Md. Matiul Islam[1*] and Mohammad Bashir Ahmed[1]

[1]Agrotechnology Discipline, Khulna University, Khulna-9208, Bangladesh.

Authors' contributions

This work was carried out in collaboration among all authors. Author NYN collected data, performed the statistical analysis, managed the literature searches and wrote the first draft of the manuscript. Author MMI designed the study, helped in performing statistical analysis, helped the literature searches and edited the draft manuscript. Author MBA edited the draft manuscript. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJAEES/2019/v33i330178
Editor(s):
(1) Dr. Fotios Chatzitheodoridis, Professor, Department of Agricultural Technology-Division of Agricultural Economics, Technological Education Institute of Western Macedonia, Greece.
Reviewers:
(1) Marina Mazón, Universidad Nacional de Loja, Ecuador.
(2) İsmail Ukav, Adiyaman University, Turkey.
Complete Peer review History: http://www.sdiarticle3.com/review-history/49421

Original Research Article

Received 25 March 2019
Accepted 01 June 2019
Published 21 June 2019

ABSTRACT

The study assessed the participation of rural women in organic farming and explored the relationship between selected characteristics of the rural women and their extent of participation in organic farming. This investigation was a survey type of research involving descriptive and diagnostic type of research design. The study was conducted at seven unions of Batiaghata Upazila under Khulna district of Bangladesh namely Amirpur, Gangarampur, Jalma, Batiaghata, Baliadanga, Bhanderkote and Surkhali. Data were collected from randomly selected 140 respondents during the period of 20th January to 15th February, 2019. Correlation(s) test was used to ascertain the relationships between the concerned independent variables and the dependent variable and simple linear regression was done to determine the effect of the selected five independent variables (agricultural training, knowledge, attitude, practice and problem) on participation. Majority (52.1%) of the women had medium participation followed by high (44.3%) and low (3.6%) participation. Considering broadly selected 7-aspects of organic farming, the rural women's participation was highest in land management while it was lowest in marketing the product. Among 24 issues women were found to be greatly involved in collection of organic product from their own residence while it was least in case of collection of organic product from farm. Agricultural training, knowledge, attitude

**Corresponding author: E-mail: matiul_rubel@yahoo.com;*

and practice showed positive significant relationship out of fifteen selected characteristics of rural women and only problem showed negative significant relationship with their participation in organic farming. In case of simple linear regression 7%, 14.44%, 18.85%, 18.96% and 8.69% of the participation can be explained by the variables as agricultural training, knowledge, attitude, practice and problem respectively. It can be concluded that women participation was confined only in small scale crop production and there is a need for further enhancement of the extent of participation of rural women in organic farming.

Keywords: Agricultural activities; organic farming; rural women; participation.

1. INTRODUCTION

Organic farming is the production of crops and livestock without the use of synthetic chemicals and inorganic fertilizers. Organic agriculture aims at human welfare without any harm to the environment which is the foundation of human life itself [1]. The US Department of Agriculture defines organic farming as "Organic farming is a production system which avoids or largely excludes the use of synthetically compounded fertilizers, pesticides, growth regulators and livestock feed additives" [2]. Bangladesh is basically an agricultural country. The economy of Bangladesh is largely dependent on agriculture. Agriculture contributes about 14.74% to country's total GDP [3]. In 2018, the growth of GDP of Bangladesh was 7.86% [4]. Rice export contributed a good share to this growth. The Executive Committee of the National Economic Council (ECNEC) reported on March 2019 that, the growth of GDP expanded to 8.13%, and the contribution of agriculture to this growth is also tremendously increasing [4]. In Bangladesh, the modern agriculture is truly accompanied with traditional organic form of agriculture from the time immemorial where women are typically and functionally contributing from the very beginning. That experience of organic farming can be an option for economically and ecologically sound farming in Bangladesh.

The growing participation of women in agriculture has made a big change in our rural economy, making them a big contributor to country's overall economy. 10% rise in women workforce raised Bangladesh's GDP by 1% in 2017 [5]. The overall contribution of women workforce in our GDP is 34%; it would take the country forward in attaining higher GDP growth in line with achieving the SDGs by 2030 [5]. The major SDGs for Bangladesh, such as "*end poverty*", "*end hunger*", "*gender equality and women empowerment*" etc. could be better addressed by ensuring the functional participation of rural women in production activities in both agricultural and non-agricultural sectors [6].

Empowerment puts a name to the process of change in women's sense of self-confidence and ability to deal with the world, changes which can be seen on the ground. The empowerment of rural women in organic and sustainable farming sector must take into account the interrelatedness between biodiversity, local and indigenous knowledge. Women are playing a crucial role in the organic food cultivation processes. Sustainable women farmers appear to have had more success in becoming part of and contributing to the development of sustainable farming system. On the farm, women are very important for saving seeds, maintaining biodiversity, production of traditional crops and livestock, which in turn provides healthy and safe food and good nutrition. Food security as a priority for organics may also enabling women's empowerment since they hold, in most cultures, a central role in providing nutrition for the household.

Women in our rural areas greatly contribute through their household and agricultural work but their work has hardly been recognized by measuring their participation extents in a formal research approach [7,8]. Considering this fact the researchers persuaded to conduct the present research.

In order to proper direction to the research the following specific objectives were formulated:

i. To determine and describe the personal socioeconomic characteristics of the rural women.
ii. To determine extent of participation of rural women in organic farming.
iii. To explore the relationships between selected characteristics of rural women and extent of participation in organic farming practices.

iv. To identify those inhibiting factors associated with participation.

2. METHODOLOGY

The study was conducted at seven unions (Amirpur, Gangarampur, Jalma, Batiaghata, Baliadanga, Bhanderkote and Surkhali) of Batiaghata Upazila in Khulna District of Bangladesh under which eleven villages were selected for this research which are situated at the convenient distance from Khulna University. Batiaghata Upazila under Khulna District possesses 248.32 sq km of area, bounded by the latitude from 22°34′ to 22°46′ north latitudes and in between 89°24′ to 89°37′ east longitudes. This Upazila has an average literacy rate of 53.18%, having agriculture (57.45%) as major source of income with 51.92% inhabitants residing in rural villages [9]. The rural women of the study area who were participating in organic farming were treated as population of this study. The primary data were collected through the use of interview schedule. In total 140 women were selected through purposive random sampling technique (Table 1) who cultivated crops organically in their homestead area or in farm.

Reviewing related studies, the researcher considered 15 personal, socioeconomic and psychological characteristics of rural women as independent variables such as, personal (age, education, family size, farming experience, organic farming experience), economic (annual income, farm size), social (organizational participation, agricultural training, cosmopolitanism, extension contact), psychological (knowledge, attitude, practice and problem related to organic farming) (Table 2) and participation of rural women in organic farming (Table 3) was treated as dependent variable. Seven important broad aspects along with 24-issues (Table 4) were considered for measuring women participation in organic farming. The seven broad aspects were land management, seed management, fertilizer management, intercultural operation, harvesting the product, collecting organic product, and marketing the product (Table 4).

The researcher converted all qualitative data to quantitative form by means of applying some appropriate scoring technique. A coding plan was developed and code numbers were given to each category of measurements. For determining the extent of participation of rural women in organic farming they were categorized into three groups as low participation (≤24), medium participation (25-48) and high participation (>48). A rating scale was used to determine the extent of participation where 'regularly', 'occasionally', 'rarely' and 'not at all' were assigned for 3, 2, 1 and 0 scores respectively. So, the score of the women could range from "0 (=0×24) to 72 (=3×24)" where score "0" indicating no participation and score "72" indicating highest level of participation of rural women in organic farming. To compare the level of participation in seven major aspects as well as 24-issues participation score (PS) and participation index (PI) for each of the seven major aspects and 24-issues were calculated by using the following formula:

$$PS = (N_1 \times 0) + (N_2 \times 1) + (N_3 \times 2) + (N_4 \times 3)$$

where,
PS = Participation Score
N_1= No. of respondents participated not at all
N_2= No. of respondents participated rarely
N_3= No. of respondents participated occasionally
N_4= No. of respondents participated regularly

$$\textbf{Participation score} = \frac{\textbf{Observed participation score}}{\textbf{Possible highest participation score}} \times \mathbf{100}$$

The score for extent of individual participation in each aspect of organic farming by rural women could be ranged from "0 (=0×140) to 420 (=3×140)" where "0" means no participation and "420" means regular participation. The status of rural women for organizational participation, cosmopolitanism, extension contact, knowledge, attitude, practice and problem faced in organic farming were computed following standard procedures [7,8,10,11,12].

The researcher collected data through face to face interview during the free time of the respondents. Statistical treatments such as range, means, standard deviation, maximum, minimum, rank order, etc. were used to interpret data. Correlation(s) test was used to ascertain the relationships (for ratio data Pearson's product moment correlation score "r" and for ordinal data Spearman's rank order correlation score "ρ" was used) between the concerned independent variables and the dependent variable. Simple linear regression was done to determine the contributing effects of the independent variables on participation. Statistical Package for Social Science (SPSS) version 20.0 was used for data analysis.

3. RESULTS AND DISCUSSION

3.1 Results

3.1.1 Selected characteristics of the rural women

Young women (58.6%) were highly involved in organic framing followed by middle aged (29.3%) and old aged women (12.1%). That means young aged women were more motivated towards organic farming than old aged women. Highest proportion (47.1%) of women had secondary level of education while 22.1% women could sign their name only and 18.6% of women had higher secondary level of education. Majority (52.1%) of rural women possessed small size family followed by medium size (36.4%) and large size family (11.4%). Majority of women (58.6%) had low farming experience where 32.1% of farmers had medium farming experience and 9.3% had high farming experience (Table 2).

Majority of the rural women (59.3%) had lower experience followed by 32.9% had medium and only 7.9% possessed higher experience in organic farming. Highest proportion of the respondents (52.9%) had high income while 25% had low income and only 22.1% had medium income. Most (85.7%) of women had their revenue source from crop sector and only 14.3% were involved in other income sectors. More than half (57.1%) of the respondents had small farm size and only 0.7% had large farm size. However, 11.4% of the respondents had medium farm size and 27.9% of the respondents had marginal farm size where only 2.9% of the respondents were landless (Table 2).

Among 140 of respondents, 42.1% of respondents had no interest towards participation in any organization where 57.9% of the respondents had low participation. Highest proportion of women (58.6%) had no training exposure followed by 32.9% had low training and 8.6% had medium training opportunity. In case of agricultural training exposure, majority of the women (57.1%) did not get the opportunity to participate in agricultural training program whereas more than one-third of the women (36.4%) had low training exposure followed by medium (4.3%) and only 2.1% of women had high training exposure. In case of participation in different agricultural training majority (37.5%) of women participated in training on rice cultivation followed by 33.75% in poultry rearing, 23.5% in fertilizer management, 12.5% in fish culture, 8.75% in integrated pest management, 3.75% in water management and 8.75% of women get their training in other sectors (Data not shown in Table).

Majority (55%) of the rural women had low cosmopolitanism compared to 43.6% and 1.4% having medium and high cosmopolitanism respectively. The highest proportion (47.9%) of the rural women had low extension contact as compared to 25.7% had medium extension contact where there were no women who possessed higher extension contact. Two-third (65%) of the rural women had medium knowledge on organic farming compared to 25% and 10% having low and high knowledge on organic farming respectively. The highest proportion (70.7%) of the rural women had highly favorable attitude towards organic farming compared to 29.3% having moderate attitude. There were no women who showed low attitude towards organic farming. Above three-fourth of the women (80.7%) belonged to medium practice categories followed by 15.0% in low practice category and only 4.3% women highly practice organic techniques (Table 2).

Table 1. Sampling plan for the study

Upazila	Union	Selected village	No. of selected rural women
Batiaghata	Amirpur	Narayankhali	20
	Gangarampur	Debitola	20
		Katialangla	20
	Jalma	Guptomari	20
		Sachibunia	20
	Batiaghata	Hatbati	20
		Kismot fultola	20
	Baliadanga	Birat talbunia	20
		Talbunia	20
	Bhanderkote	Lokkhikhola	20
	Surkhali	Surdara	20
Total			140

Table 2. Distribution of rural women according to their selected characteristics (N= 140)

Parameter	Category	Score	Respondents (N=140)		Mean	SD	Min	Max
			Number	Percentage				
Age	Young	≤35	82	58.6				
	Middle	36-55	41	29.3	36.76	11.26	17	65
	Old	>55	17	12.1				
Education	Illiterate	0	5	3.6				
(Schooling years)	Sign	0.50	31	22.1				
	Primary	1-5	26	18.6				
	Secondary	6-10	66	47.1	6.20	4.25	00	18
	HSC	11-12	8	5.7				
	BSc	13-16	2	1.4				
	MSc	>16	2	1.4				
Family size	Small	≤4	73	52.1				
(No. of	Medium	5-7	51	36.4	5.01	2.22	2	16
members)	Large	>7	16	11.4				
Farming experience	Low	≤10	82	58.6				
(Years)	Medium	10-20	45	32.1	10.23	7.56	1	35
	High	>20	13	9.3				
Organic farming	Low	≤10	83	59.3				
experience	Medium	10-20	46	32.9	9.6	6.74	1	32
(Years)	High	>20	11	7.9				
Annual income	Low	≤120000	35	25.0				
(BDT)	Medium	120001-180000	31	22.1	233828.89	153135.00	50600	750000
	High	>180000	74	52.9				
Farm size	Landless	<0.02	4	2.9				
(ha)	Marginal	0.02-0.20	39	27.9				
	Small	0.21-1.0	81	57.9	0.60	1.08	0.01	11.55
	Medium	1.01-3.0	16	11.4				
	Large	>3	0	0				
	No	0	59	42.1				
Organizational	Low	≤6	81	57.9				
Participation	Medium	7-12	0	0	1.74	0.80	1	4
(Score)	High	>12	0	0				

Agricultural training	No	0	82	58.6				
(No. of training)	Low	≤3	46	32.9	1.04	1.42	0	5
	Medium	4-5	12	8.6				
Cosmopolitanism	Low	≤8	77	55.0				
(Score)	Medium	9-16	61	43.6	8.15	3.05	2	17
	High	>16	2	1.4				
Extension	Low	≤11	67	47.9				
contact	Medium	12-22	36	25.7	9.02	5.31	1	21
(Score)	High	>22	0	0				
Knowledge	Low	<6.5	35	25.0				
(Score)	Medium	6.51-13	91	65.0	8.96	3.29	2	17
	High	>13	14	10.0				

Table 2. ***Continued…***

Parameter	**Category**	**Score**	**Respondents (N=140)**		**Mean**	**SD**	**Min**	**Max**
			Number	**Percentage**				
Attitude	Low	≤28	0	0				
(Score)	Medium	29-44	41	29.3	47.26	5.51	29	62
	High	>44	99	70.7				
Practice	Low	≤10	21	15				
(Score)	Medium	11-20	113	80.7	14.44	3.62	4	22
	High	>20	6	4.3				
Problem	Low	≤20	12	8.6				
(Score)	Medium	21-40	120	85.7	30.84	7.04	11	47
	High	>40	8	5.7				

**SD- Standard deviation, Min.- Minimum, Max.- Maximum , Source: Field survey, 2019*

Table 3. Participation distribution of rural women based on participation score

Categories	Score	Respondents (N=140)		Mean	SD	Min.	Max.
		Number	Percentage				
Low participation	Up to 24	5	3.6				
Medium participation	25-48	73	52.1				
High participation	Above 48	62	44.3	45.36	10.15	18	69
Total		140	100				

Source: Field survey, 2019

The majority of the women belonged to medium problem category classified as highest proportion (85.7%) followed by 8.6% as low problem and (5.7%) as high problem category (Table 2). Weeds problem, lack of available information, poor research- extension- farmers linkage, lack of training, inadequate credit support were the major problems faced by organic farmers [13].

Participation of rural women in organic farming ranged from 18-69 against the possible range of 0-72, with a mean of 45.36 and standard deviation of 10.15 (Table 3). Based on categorization above half of the rural women (52.1%) of the study area had medium participation in organic farming activities compared to 44.3% and 3.6% having high and low level of participation in organic farming (Table 3).

Data present in Table 3 show that rural women had medium to high participation in organic farming.

Organic farming is a traditional system of farming followed by rural women from a long time back. They choose organic farming as a sustainable source of income, easy method of farming, good and healthy source of nutrient.

3.2 Extent of Participation of Rural Women in Selected 7-Aspects Along with 24-Issues under 7-Aspects in Organic Farming

To measure the participation of women in organic farming the activities were arranged in twenty four issues under seven aspects where Participation Score (PS) and Participation Index (PI) were calculated (Table 4). PI was ranged from 0 to 97.62. According to PI, collection of organic product from own residence (PI= 97.62), collection of material (Animal manure, agricultural residue, household garbage) (PI= 97.38) and decomposing of compost (PI= 91.43) were ranked as 1st, 2nd and 3rd respectively and so on.

On the other hand, participation Score (PS) of respondents was ranged from 79 to 347. On the basis of participation score land management ($\bar{x}$ = 347) followed by harvesting the product ($\bar{x}$ = 325), fertilizer management ($\bar{x}$ = 313.71), intercultural operation ($\bar{x}$ = 259.5), seed management ($\bar{x}$ = 232.75), collecting the product ($\bar{x}$ = 105.25) and marketing the product ($\bar{x}$ = 79) were ranked gradually from 1st to 7th.

Researchers found that women of North Dry Zone of Northern Karnataka preferred to involve in different part of organic farming activities like seed preservation, transplanting, weeding, vermicompost preparation, storage etc [14].

3.3 Relationship between the Selected Characteristics of Rural Women and Extent of Women Participation in Organic Farming

3.3.1 Correlation coefficient

Coefficient of correlation was computed in order to explore the relationship between the fifteen selected characteristics of the rural women and their participation in organic agricultural activities. This correlation has been done by using Spearman's Rank Order Correlation Coefficient (ρ) (for ordinal type of data) as well as Pearson's Product Moment Correlation Coefficient (r) (for ratio type of data).

Among the 15 selected characteristics agricultural training, knowledge, attitude, practice showed a positive and significant relationship between those variables and participation of rural women in organic farming. Researchers found significant relationship between agricultural training of organic farmers and their attitude at 5% level of probability [15].

Table 4. Relative position (Rank order) of the selected 7-aspects along with 24-issues of rural women in case of participation in organic farming based on participation score (PS) and participation index (PI) (N=140)

Activities	Degree of participation							
	Regularly (3)	Occasionally (2)	Rarely(1)	Not at all (0)	PS	PI	Rank (24-issues)	Rank (7-aspects)
A. Land Management								
1. Land selection	95×(3)	30×(2)	7×(1)	8×(0)	352	83.81	6th	
2. Land preparation	87×(3)	37×(2)	7×(1)	9×(0)	342	81.43	9th	
$\bar{X}$ of A					347			1st
B. Seed Management								
3. Seed collection	106×(3)	17×(2)	8×(1)	9×(0)	360	85.71	5th	
4. Seed treatment	2×(3)	1×(2)	4×(1)	133×(0)	12	2.86	21st	
5. Seed sowing	103×(3)	15×(2)	6×(1)	16×(0)	345	82.14	8th	
6. Seed preservation	58×(3)	17×(2)	6×(1)	59×(0)	214	50.95	15th	
$\bar{X}$ of B					232.75			5th
C. Fertilizer Management								
a. Preparation of fertilizer at home								
7. Collection of material (Animal manure, Agricultural residue, kitchen garbage)	132×(3)	6×(2)	1×(1)	1×(0)	409	97.38	2nd	
8. Decomposing	122×(3)	7×(2)	4×(1)	7×(0)	384	91.43	3rd	
9. Moistening and turning the compost	107×(3)	11×(2)	8×(1)	14×(0)	351	83.57	7th	
10. Maintaining the compost	102×(3)	13×(2)	9×(1)	16×(0)	341	81.19	10th	
11. Harvesting the compost	101×(3)	14×(2)	8×(1)	17×(0)	339	80.71	11th	
12. Applying the Compost	97×(3)	16×(2)	7×(1)	20×(0)	330	78.57	12th	
b. Directly purchase the compost	7×(3)	9×(2)	3×(1)	121×(0)	42	10	20th	
$\bar{X}$ of C					313.71			3rd

Table 4. Continued…

Activities	Degree of participation							
	Regularly (3)	Occasionally (2)	Rarely (1)	Not at all (0)	PS	PI	Rank (24-issues)	Rank (7-aspects)
D. Intercultural Operation								
13. Irrigation	120×(3)	9×(2)	4×(1)	7×(0)	382	90.95	4th	
14. Weeding	91×(3)	20×(2)	9×(1)	20×(0)	322	76.67	13th	
15. Thinning	59×(3)	24×(2)	9×(1)	48×(0)	234	55.71	14th	
16. Pest control	16×(3)	18×(2)	16×(1)	90×(0)	100	23.81	17th	
$\bar{X}$ of D					259.5			4th
E.Harvesting the Product	96×(3)	14×(2)	9×(1)	24×(0)	325	77.38		2nd
F. Collecting organic product								
17. Directly from farm	2×(3)	2×(2)	1×(1)	135×(0)	11	2.62	22th	
18. From own residence	135×(3)	2×(2)	1×(1)	2×(0)	410	97.62	1st	
19.From other's residence	0×(3)	0×(2)	0×(1)	140×(0)	0	0		
20.From local businessman	0×(3)	0×(2)	0×(1)	140×(0)	0	0		
$\bar{X}$ of F					105.25			6th
G. Marketing the Product								
21. Packaging	11×(3)	10×(2)	2×(1)	117×(0)	55	13.09	18th	
22. Transporting	8×(3)	11×(2)	4×(1)	117×(0)	50	11.90	19th	
23. Selling the product	14×(3)	42×(2)	6×(1)	78×(0)	132	31.43	16th	
$\bar{X}$ of G					79			7th

Only the value of coefficient of correlation *ρ* (-0.268**) represented a negative and significant relationship between problem faced by women in organic farming and women participation in organic farming. This analyzed that participation of women might be declined in organic farming with the increase of problem.

3.3.2 Regression coefficient

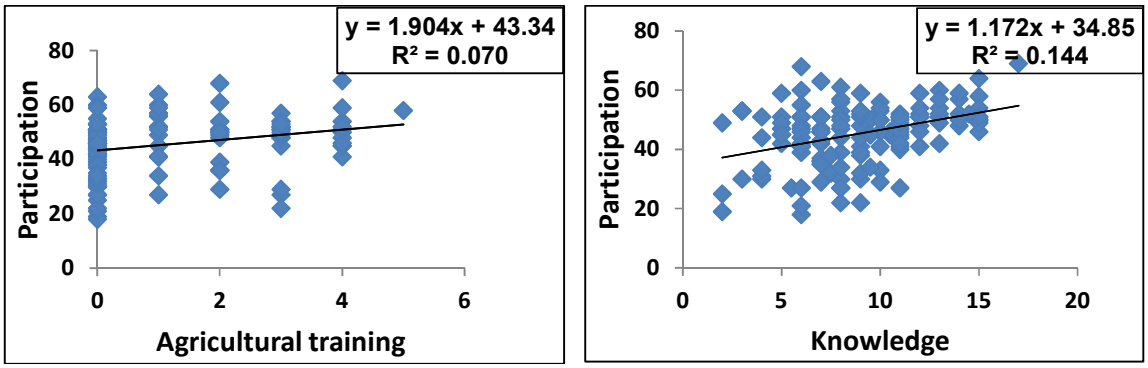
Coefficient of simple linear regression was computed to predict the contribution effect of independent variables (agricultural training, knowledge, attitude, practice, and problem; the variables which were significantly correlated with the dependent variable) on the participation of rural women in organic farming practices. This result will give an understanding about how the value of dependent variable changes with the changes of any one in the independent variables when the others are held fixed.

In case of simple linear regression the participation of women increased with the increase of agricultural training, knowledge, attitude, and practice where 7%, 14.44%, 18.85% and 18.96% of the participation can be explained by the above variables respectively. On the other side women participation decreased with the increase of problems where participation can be explained by 8.69% of the problem.

Table 5. Correlation coefficient between the selected characteristics of rural women and extent of women participation in organic farming

Independent variable (Personal socio-economic characteristics)	Focus variable (Dependent variable)	Computed value	Type of correlation
Age	Participation of rural women in organic farming	-0.068^{NS}	*r*
Education		-0.038^{NS}	
Family size		-0.063^{NS}	
Farming experience		0.022^{NS}	
Organic farming experience		-0.011^{NS}	
Annual income		0.053^{NS}	
Farm size		0.090^{NS}	
Agricultural training		0.264**	
Organizational participation		0.084^{NS}	
Cosmopolitanism		0.020^{NS}	
Extension contact		0.168^{NS}	
Knowledge		0.343**	*ρ*
Attitude		0.359**	
Practice		0.381**	
Problem		-0.268**	

*NS- Non-Significant; ** Significant at 1% level of probability*



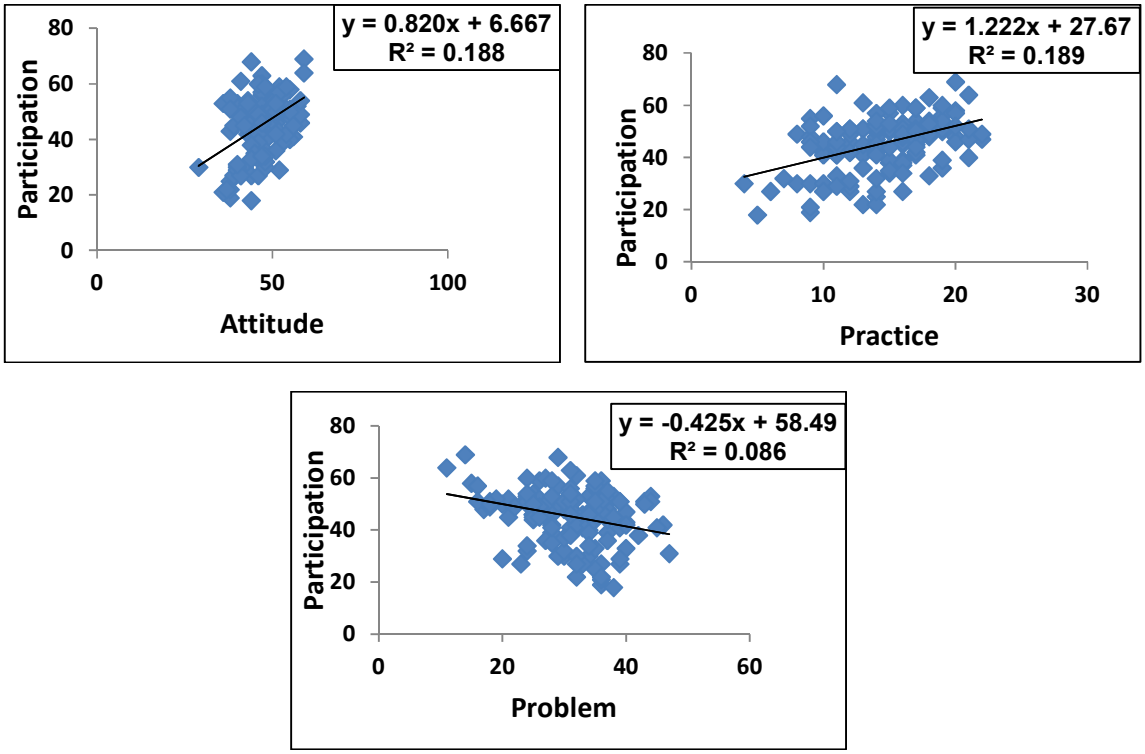


Fig. 1. Simple regression analysis of training, knowledge, attitude, practice and problem on participation of rural women in organic farming

3.4 Discussion

The participation of rural women in organic and sustainable farming sector must consider the interrelatedness between biodiversity, local and indigenous knowledge. Women farmers appear to have had more success in becoming a part of and contributing to the development of sustainable farming system. On the farm, women's participation are very important for saving seeds, maintaining biodiversity, production of traditional crops and livestock, which in turn provides healthy and safe food and good nutrition. Food security as a priority for organics may also enabling women's participation since they hold, in most cultures, a central role in providing nutrition for the household. In the site of agriculture their involvement is considerable. Thus, the study was conducted mainly for the investigation towards sustainable agriculture through participation of rural women in organic farming, to get a clear understanding about participation of rural women in organic farming practices. With the rise of organic farming, women saw and embraced an alternate way to participate in agriculture.

The environmental concern is identified as the most important factor for organic farmers. [16] revealed that environmental concern has positive impact toward farmers' attitude on organic farming. The better attitude; in turn, positively affect for famers intention to adopt organic farming. Herath and Wijekoon [17] mentioned that conventional farmers were not motivated to practice organic farming due to its productivity had been low. Conversely, organic growers performed the organic farming mainly due to the marketing assistance and inputs and they also had favorable attitudes towards the environment. Knowledge about organic farming and extension worker contacts greatly influence towards adopting organic farming. Sudheer [18] confirmed that organic farming is generally more profitable in terms of financial costs and returns than chemical farming in India. Analysis of the farmers perception of organic farming revealed that electronic media (television) is the prime motivator for farmers to adopt organic practices. Farmers believed that organic farming improves soil fertility and their profits in the long run.

Desai [14] conducted a research to find out the role of women in organic farming, assessed and

compared the family quality index of organic and conventional farm families in the selected agro-climatic zones of Northern Karnataka. Researchers identified the problems and suggested the requirements of technical knowledge and skills for women involved in organic farming and lastly focused on the need of training program based on felt needs of women in organic farming. The sustainable agricultural sector has been quite successful in creating women-friendly spaces. Women are primarily interested in running small farms and working with family labor. For women in particular, the boundaries between economic and non-economic activities are often fluid, as women seek to combine their roles as a mother and homemaker with community development and with income generation stated by Farnworth and Hutchings [19]. Mazhar et al. [20] stated that Gram-karmies (women) were the backbone of Nayakrishi in Bangladesh. Nayakrishi has a special emphasis on supporting women through giving incentives. They also suggest the women's to collect seed from local varieties. They were involved in training and campaigning of the farmers about organic farming.

Our finding indicates that about two-third (65%) of the rural women had medium knowledge on organic farm activities compared to 25% and 10% had low knowledge and high knowledge on organic farming respectively. Farouque and Sarker [21] showed in their study that organic farmers had low to medium level of knowledge. But [12] found that farmers possessed medium to high level of knowledge on organic farming. It was observed that rural women had much knowledge about organic farming in spite of having low extension contact and training. It also revealed that the rural women usually gained knowledge on organic farming mostly from their own experience as well as from their husband or parental house. It was remarkable that the rural women of the study area were very conscious about organic farming.

In our study, majority of women possessed positive attitude towards organic farming that was about 70.7% and 29.3% had medium attitude towards organic farming. In case of low attitude the percentage was zero. Women's are now more concerned about the use of harmful fertilizers and pesticides. But the organic product is still very small because farmers only adopt organic farming in small scale crop production such as growing vegetables in homestead area. Mohan and Helen [22] showed that majority of the organic farmers had a favorable and highly favorable attitude towards organic farming practices. Organic farming as a sustainable source of income, most of the rural women support this statement as women can able to support her family through growing vegetable using organic compost in their homestead area. This helps to meet their family needs as well as support them economically. Most of the women showed positive attitude in case of organic crop cultivation as it provide human with a good health and nutrition.

The present study reveals that 80.7% of the respondents had medium practice, where 15% had low practice. However, it is observed that still a small portion (4.3%) of the organic vegetable growing women highly practiced organic farming technologies. This study explores that organic farming has become popular among the rural women. They adopted organic farming as a low cost crop production technique. Poddar et al. [13] obtained the similar findings. Research conducted by [21] showed the opposite result as organic farmers follow different organic farming techniques in low to medium category.

Data of the present research indicates that above half of the respondents (52.1%) had medium level of participation in organic farming followed by 44.3% had high level of participation and only 3.6% of rural women practiced low. Organic farming is a traditional system of farming followed by women from a long time back. They choose it as a sustainable source of income, easy method of farming, good and healthy source of nutrient. Organic and sustainable farming has the potential to create new structures that actively work towards achieving women's empowerment and protecting the use of indigenous knowledge. The respondents of this study area participate in those organic farming activities to different extent. Women mostly participated in activities like collection of composting material, collection of organic product from own residence, decomposing of compost, irrigation etc. Involvement of women in organic farming actually promotes interdependent and accountable relationships that contribute to the pursuit of women's rights and needs.

As majority of rural women were found to practice organic farming in medium to low level so massive arrangement of campaigns by the public extension organization (Department of Agricultural Extension) and the local level NGO's

can be helpful to enhance the rate of participation. Lack of credit support and lack of education were the major problem. Concerned authority should ensure available supply of credit to the rural women so that they can invest more money to participate in organic farming programs. At the same time proper arrangement should be made for provide education to the rural women that might be helpful for creating awareness regarding organic farming.

A small piece of research having conducted in some specific locations cannot provide all information for proper understanding about actual participation rate of women in organic farming and other related affairs. Following research study should be undertaken for covering more dimensions regarding organic farming. The study was conducted to find out the extent of participation of rural women in organic farming. Further research should be taken to find out the empowerment of rural women through sustainable agricultural system and in other related topics.

Organic farming in Bangladesh is only practice by few commercial producers and farmers only practice it for small scale crop cultivation. The findings may prove helpful for field level extension workers and researchers to improve strategies of action to motivate the farmers to adopt organic farming in large scale crop production in Bangladesh. Finally, it is assumed that the recommendation of the study will be helpful to reduce hindrance of organic farming faced by women and to develop policy and standards for organic food product supply throughout the country.

4. CONCLUSION

Based on the results and its logical interpretation it can be concluded that highest proportion of rural women had low to medium (55.7%) followed by high (44.3%) participation in organic farming. Among 7-aspects of participation, the participation was highest in land management $(\overline{X} = 347)$ followed by harvesting $(\overline{X} = 325)$, fertilizer management $(\overline{X} = 313.71)$, intercultural operation $(\overline{X} = 259.5)$, seed management $(\overline{X} = 232.75)$ and collection of product $(\overline{X} = 105.25)$, while it was least in marketing $(\overline{X} = 79)$. In case of 24-issues under 7-aspects of organic farming, the highest dominant area of participation by the women was collection of product from own residence $(\overline{X} = 97.62)$. Agricultural training, knowledge, attitude, practice showed a significant positive relationship with their participation in organic farming.

Thus, it might be concluded from the gist of findings mentioned above that, participation of women in organic farming is still not satisfactory and necessary steps concerning extension approach as well as adequate support should be provided to increase the participation by ensuring barrier free participation of rural women in organic farming.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Hoque MN. Eco-friendly and organic farming in Bangladesh-International classification and local practice. Ph.D. Thesis, Justus Liebig University, Giessen, Germany; 2012.
2. FiBL and IFOAM. The world of organic agriculture: Statistics and Emerging Trends; 2019.
3. BBS. Bangladesh Bureau of Statistics. Statistical Division, Ministry of Planning, People's Republic of Bangladesh, Dhaka, Bangladesh; 2017.
4. Available:http://www.thedailystar.net (March 19, 2019)
5. Available:http://www.dhakatribune.com (March 8, 2017)
6. Bangladesh Planning Commission. Sustainable Development Goals: Bangladesh Progress Report 2018. General Economics Division, Bangladesh Planning Commission, Ministry of Planning, Bangladesh; 2018.
7. Biswas S, Islam MM. Farmers' problem confrontation in organic farming at Magura Sadar Upazila of Bangladesh. South Asian Journal of Agriculture. 2018;7(1&2):19-24.
8. Islam MA, Ahmed MB, Islam MM. Participation of rural women in activities related to homestead vegetable cultivation at Monirampur Upazila under Jessore District. Journal of Bangladesh Agricultural University. 2018;16(1):17-22. DOI: 10.3329/jbau.v16i1.36475
9. Available:http://en.banglapedia.org/index.php?title=Batiaghata_Upazila (May 30, 2019)
10. Sheel M, Ahmed MB, Khan SAKU, Islam MM. Present scenario and problem

confrontation of rooftop gardening and its efficacy in ambient environment reclamation in Khulna City of Bangladesh. Fundamental and Applied Agriculture. 2019;4(1):617–626.
DOI: 10.5455/faa.2656

11. Pervin S, Chowdhury AR, Islam MM, Ahmed MB, Ara R. Present status and problem confrontation of oilseed cultivation in southwest region of Bangladesh. Journal of Bangladesh Agricultural University. 2018;16(2):198-207.
DOI: 10.3329/jbau.v16i2.37961
12. Shiduzzaman M, Ahmed MB, Islam MM. Extent of adoption of vermicompost by the farmers of Batiaghata Upazila under Khulna district of Bangladesh. Journal of Agroecology and Natural Resources Management. 2018;5(2):76-81.
13. Poddar PK, Miah MAM, Uddin MN, Dev DS. Conservation agriculture: A farm level practice in Bangladesh. Research Journal of Agriculture Science Digest. 2017;37(3): 197-202.
14. Desai RM. Role of women in organic farming and their family quality index in the selected agro-climatic zones of Northern Karnataka. Ph.D. (Family Resource Management) Thesis, Department of Family Resource Management, College of Rural Home Science, University of Agricultural Sciences, Dharwad; 2013.
15. Rana S, Hasan MH, Alam MS, Islam MS. Farmer attitude towards organic vegetable cultivation in Rangunia Upazila, Chittagong, Bangladesh. Journal of Bioscience and Agriculture Research. 2017;14(1):1151-1156.
16. Ashari, Sharifuddin J, Mohammed ZA, Terano R. Rice farmers' perception and attitude toward organic farming adoption. Journal of Agricultural Economics. 2016;34(1):35-46.
17. Herath CS, Wijekoon R. Study on attitudes and perceptions of organic and non-organic coconut growers towards organic coconut farming. IDESIA. 2013;31(2):5-14.
18. Sudheer PSK. Economics of organic versus chemical farming for three crops in Andhra Pradesh, India. Journal of Organic Systems. 2013;8(2):36-49.
19. Farnworth C, Hutchings J. Organic agriculture and women's empowerment. Published by International Federation of Organic Agriculture Movements (IFOAM), Germany; 2009. ISBN 13: 978-3-940946-15-7.
20. Mazhar F, Akhter F, Jony JA, Haque R. Naya Krishi Andolan: Recreating community based organic farming. Leisa, India. 2001;3(2):15-17.
21. Farouque MG, Sarker MA. Farmers' knowledge and practice of organic vegetable cultivation: A field level study of two villages of Bangladesh. Journal of Agricultural Extension and Rural Development. 2018;10(5):99-107.
22. Mohan DJ, Helen S. Attitude of farmers towards organic vegetable cultivation. Hind Agri-Horticultural Society. 2014;9(3):364-367.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle3.com/review-history/49421