

PARTICIPATION OF RURAL WOMEN IN ORGANIC FARMING

ABSTRACT

The study assessed the participation of rural women in organic farming and to explore 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 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 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.

Key words: Participation, rural women, organic farming, descriptive and diagnostic, Batiaghata Upazila.

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 (Hoque, 2012). 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 (BBS, 2017). Organic farming can be an option for economically and ecologically sound farming in Bangladesh.

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" (FiBL, 2019).

30 The growing participation of women in agriculture has made a big change in our rural economy,
31 making them a big contributor to country's overall economy. The contribution of women workforce in
32 our GDP is 34%; it would take the country forward in attaining higher GDP growth in line with
33 achieving the SDGs by 2030 (<http://www.dhakatribune.com>). Empowerment puts a name to the
34 process of change in women's sense of self-confidence and ability to deal with the world, changes
35 which can be seen on the ground.

36 The empowerment of rural women in organic and sustainable farming sector must take into account
37 the interrelatedness between biodiversity, local and indigenous knowledge. Women are playing a
38 crucial role in the organic food cultivation processes. Sustainable women farmers appear to have had
39 more success in becoming part of and contributing to the development of sustainable farming system.
40 On the farm, women are very important for saving seeds, maintaining biodiversity, production of
41 traditional crops and livestock, which in turn provides healthy and safe food and good nutrition. Food
42 security as a priority for organics may also enabling women's empowerment since they hold, in most
43 cultures, a central role in providing nutrition for the household.

44 Women in our rural area greatly contribute through their household and agricultural work but their
45 work has hardly been recognized. Considering this fact the researchers persuaded to conduct the
46 present research.

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

- 48 i. To determine and describe the personal socioeconomic characteristics of the rural women.
- 49 ii. To determine extent of participation of rural women in organic farming.
- 50 iii. To explore the relationships between selected characteristics of rural women and extent of
51 participation in organic farming practices.
- 52 iv. To identify those inhibiting factors associated with participation.

53 2. METHODOLOGY

54 The study was conducted at seven unions (Amirpur, Gangarampur, Jalma, Batiaghata, Baliadanga,
55 Bhanderkote and Surkhali) of Batiaghata Upazila in Khulna District under which eleven villages were
56 selected for this research which is situated at the convenient distance from Khulna University.
57 Batiaghata Upazila under Khulna District possesses 248.32 sq km of area, bounded by the latitude
58 from 22°34' to 22°46' north latitudes and in between 89°24' to 89°37' east longitudes. The rural
59 women of the study area who were participating in organic farming were treated as population of this
60 study. The primary data were collected through the use of interview schedule. In total 140 (one
61 hundred forty) women were selected through Purposive random sampling technique who cultivated
62 crops organically in their homestead area or in farm.

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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	Lokkikhola	20
Surkhali	Surdara	20
Total		140

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66

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

77 The researcher converted all qualitative data to quantitative form by means of applying some
78 appropriate scoring technique. A coding plan was developed and code numbers were given to the
79 each category of measurements. For determining the extent of participation of rural women in organic
80 farming they are categorized into three groups as low participation (≤ 24), medium participation (25-48)
81 and high participation (> 48). A rating scale was used to determine the extent of participation where
82 'extreme', 'moderate', 'rarely' and 'not at all' were assigned for 3, 2, 1 and 0 scores respectively. So,
83 the score of the women could range from "0 ($=0 \times 24$) to 72 ($=3 \times 24$)" where score "0" indicating no
84 participation and score "72" indicating higher level of participation of rural women in organic farming.
85 To compare the level of participation in seven major aspects as well as 24 issues participation score
86 (PS) and participation index (PI) for each of the seven major aspects and 26 issues were calculated
87 by using the following formula:

$$88 \quad \mathbf{PS = (N_1 \times 0) + (N_2 \times 1) + (N_3 \times 2) + (N_4 \times 3)}$$

89 Where,

90 PS = Participation Score

91 N_1 = No. of respondents participated not at all

92 N_2 = No. of respondents participated rarely

93 N_3 = No. of respondents participated occasionally

94 N_4 = No. of respondents participated regularly

$$95 \quad \mathbf{Participation\ score = \frac{Observed\ participation\ score}{Possible\ participation\ score} \times 100}$$

96 The score for extent of individual participation in each aspect of organic farming by rural women could
97 be ranged from "0 ($=0 \times 60$) to 420 ($=3 \times 140$)" where "0" means no participation and "420" means
98 regular participation. To determine the extent of involvement of rural women PS and PI also computed
99 for cosmopolitanism, extension contact, attitude, practice and problem faced in organic farming.

100 The researcher collected data through face to face interview during the free time of the respondents.
101 Statistical treatments such as range, means, standard deviation, maximum, minimum, rank order, etc.
102 were used to interpret data. Correlation(s) test was used to ascertain the relationships between the
103 concerned independent variables and the dependent variable and simple linear regression was done

104 to determine the effect of the selected five independent variables on participation. Statistical Package
105 for Social Science (SPSS) version 20.0 was used for data analysis.

106 **3. RESULTS AND DISCUSSION**

107 **3.1 Selected characteristics of the rural women**

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

116 Majority of the rural women (59.3%) had lower experience followed by 32.9% had medium and only
117 7.9% possessed higher experience in organic farming. Highest proportion of the respondents (52.9%)
118 had high income while 25% had low income and only 22.1% had medium income. Majority (85.7%) of
119 women had their revenue source from crop sector and only 14.3% were involved in other income
120 sectors. More than half (57.1%) of the respondents had small farm size and only 0.7% had large farm
121 size. However, 11.4% of the respondents had medium farm size and 27.9% of the respondents had
122 marginal farm size where only 2.9% of the respondents were landless (Table 2).

123 Among 140 of respondents, 42.1% of respondents had no interest towards participation in any
124 organization where 57.9% of the respondents had low participation. Highest proportion of women
125 (58.6%) had no agricultural training followed by 32.9% had low training and 8.6% had medium training
126 opportunity. In case of agricultural training exposure, majority of the women (57.1%) did not get the
127 opportunity to participate in agricultural training program where as more than one-third of the women
128 (36.4%) had training exposure followed by medium (4.3%) and only 2.1% of women had high training
129 exposure. In case of participation in different agricultural training majority (56.25%) of women
130 participated in rice cultivation followed by 47.5% in livestock rearing, 13.5% in fertilizer management,
131 12.5% in fish culture, 8.75% in integrated pest management, 3.75% in water management and 8.75%
132 of women get their training in other sectors (Table 2)

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

143 The majority of the women belonged to medium problem category classified highest proportion
144 (85.7%) followed by 8.6% as low problem and (5.7%) as high problem category (Table 2). Weeds
145 problem, lack of available information, poor research- extension-farmers linkage, lack of training,
146 inadequate credit support were the major problems faced by organic farmers ranked by Poddar *et al.*
147 (2017).

148 Participation of rural women in organic farming ranged from 18-69 against the possible range of 0-72,
 149 with a mean of 45.36 and standard deviation of 10.15 (Table 3). Based on categorization above half
 150 of the rural women (52.1%) of the study area had medium participation in organic farming activities
 151 compared to 44.3% and 3.6% having high and low level of participation in organic farming (Table 2).
 152 Data present in Table 3 show that rural women had medium to high participation in organic farming.

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

156 **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	36.76	11.26	17	65
	Middle	36-55	41	29.3				
	Old	>55	17	12.1				
Education (Schooling years)	Illiterate	0	5	3.6	6.20	4.25	00	18
	Sign	.50	31	22.1				
	Primary	1-5	26	18.6				
	Secondary	6-10	66	47.1				
	HSC	11-12	8	5.7				
	BSc	13-16	2	1.4				
	MSc	>16	2	1.4				
Family size (No. of members)	Small	≤4	73	52.1	5.01	2.22	2	16
	Medium	5-7	51	36.4				
	Large	>7	16	11.4				
Farming experience (Years)	Low	≤10	82	58.6	10.23	7.56	1	35
	Medium	10-20	45	32.1				
	High	>20	13	9.3				
Organic farming experience (Years)	Low	≤10	83	59.3	9.6	6.74	1	32
	Medium	10-20	46	32.9				
	High	>20	11	7.9				
Annual income (BTD)	Low	≤120000	35	25.0	233828 .89	153135 .00	50600	750000
	Medium	120001- 180000	31	22.1				
	High	>180000	74	52.9				
Farm size (ha)	Landless	<0.02	4	2.9	0.60	1.08	0.01	11.55
	Marginal	0.02-0.20	39	27.9				
Annual income (BTD)	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				
	Low	≤120000	35	25.0				
Organizational Participation (Score)	Low	≤6	81	57.9	1.74	0.80	1	4
	Medium	7-12	0	0				
	High	>12	0	0				
Agricultural training (No. of training)	No	0	82	58.6	1.04	1.42	0	5
	Low	≤3	46	32.9				
	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 contact (Score)	Low	≤11	67	47.9				
	Medium	12-22	36	25.7	9.02	5.31	1	21
	High	>22	0	0				
Knowledge (Score)	Low	<6.5	35	25.0				
	Medium	6.51-13	91	65.0	8.96	3.29	2	17
	High	>13	14	10.0				

157

158 Table 2. *Continue.....*

Parameter	Category	Score	Respondents (N=140)		Mean	SD	Min	Max
			Number	Percentage				
Attitude (Score)	Low	≤28	0	0				
	Medium	29-44	41	29.3	47.26	5.51	29	62
	High	>44	99	70.7				
Practice (Score)	Low	≤10	21	15				
	Medium	11-20	113	80.7	14.44	3.62	4	22
	High	>20	6	4.3				
Problem (Score)	Low	≤20	12	8.6				
	Medium	21-40	120	85.7	30.84	7.04	11	47
	High	>40	8	5.7				
Participation (Score)	Low	≤24	5	3.6				
	Medium	25-48	73	52.1	45.36	10.15	18	69
	High	>48	62	44.3				

159 *SD- Standard deviation, Min.- Minimum, Max.- Maximum

Source: Field survey, 2019

160 **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	45.36	10.15	18	69
High participation	Above 48	62	44.3				
Total		140	100				

161

Source: Field survey, 2019

162 3.2 Extent of participation of rural women in selected 7-aspects along with 24-issues 163 under 7-aspects in organic farming

164 To measure the participation of women in organic farming the activities were arranged in twenty four
165 issues under seven aspects where participation Index (PI) and Participation Index (PI) were
166 calculated (Table 4). PI was ranged from 0 to 97.62. According to PI, collection of organic product
167 from own residence (PI= 97.62), collection of material (Animal manure, agricultural residue,

168 household garbage) (PI= 97.38) and decomposing of compost (PI= 91.43) were ranked as 1st, 2nd and
 169 3rd respectively and so on.

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

175 Desai (2013) found that women of North Dry Zone of Northern Karnataka preferred to involve in
 176 different part of organic farming activities like seed preservation, transplanting, weeding,
 177 vermicompost preparation, storage etc.

178

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

Activities	Degree of participation				PS	PI	Rank (24- issues)	Rank (7- aspects)
	Regularly (3)	Occasionally (2)	Rarely (1)	Not at all (0)				
A. Land Management								
1. Land selection	95×(3)	30×(2)	7×(1)	8×(0)	352	83.81	6 th	
2. Land preparation	87×(3)	37×(2)	7×(1)	9×(0)	342	81.43	9 th	
\bar{X} of A					347			1 st
B. Seed Management								
3. Seed collection	106×(3)	17×(2)	8×(1)	9×(0)	360	85.71	5 th	
4. Seed treatment	2×(3)	1×(2)	4×(1)	133×(0)	12	2.86	21 st	
5. Seed sowing	103×(3)	15×(2)	6×(1)	16×(0)	345	82.14	8 th	
6. Seed preservation	58×(3)	17×(2)	6×(1)	59×(0)	214	50.95	15 th	
\bar{X} of B					232.75			5 th
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	2 nd	
8. Decomposing	122×(3)	7×(2)	4×(1)	7×(0)	384	91.43	3 rd	
9. Moistening and turning the	107×(3)	11×(2)	8×(1)	14×(0)	351	83.57	7 th	

compost							
10. Maintaining the compost	102×(3)	13×(2)	9×(1)	16×(0)	341	81.19	10 th
11. Harvesting the compost	101×(3)	14×(2)	8×(1)	17×(0)	339	80.71	11 th
12. Applying the Compost	97×(3)	16×(2)	7×(1)	20×(0)	330	78.57	12 th
b. Directly purchase the compost	7×(3)	9×(2)	3×(1)	121×(0)	42	10	20 th
\bar{X} of C					313.71		3 rd

182

183

184 Table 4. *Continue.....*

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

185

186 **3.3 Relationship between the selected characteristics of rural women and extent of**
 187 **women participation in organic farming**

188 **3.3.1. Correlation coefficient**

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

193 Among the 15 selected characteristics agricultural training, knowledge, attitude, practice showed a
 194 positive and significant relationship between those variables and participation of rural women in
 195 organic farming.

196 Rana et al. (2017) found significant relationship between agricultural training of organic farmers and
 197 their attitude at 5% level of probability.

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

202 **3.3.2. Regression coefficient**

203 Coefficient of regression was computed to predict the contribution of independent variables
 204 (Agricultural training, knowledge, attitude, practice, and problem) on the participation of rural women
 205 in organic farming practices. This result will give an understanding about how the value of dependent
 206 variable changes with the changes of any one in the independent variables when the others are held
 207 fixed.

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

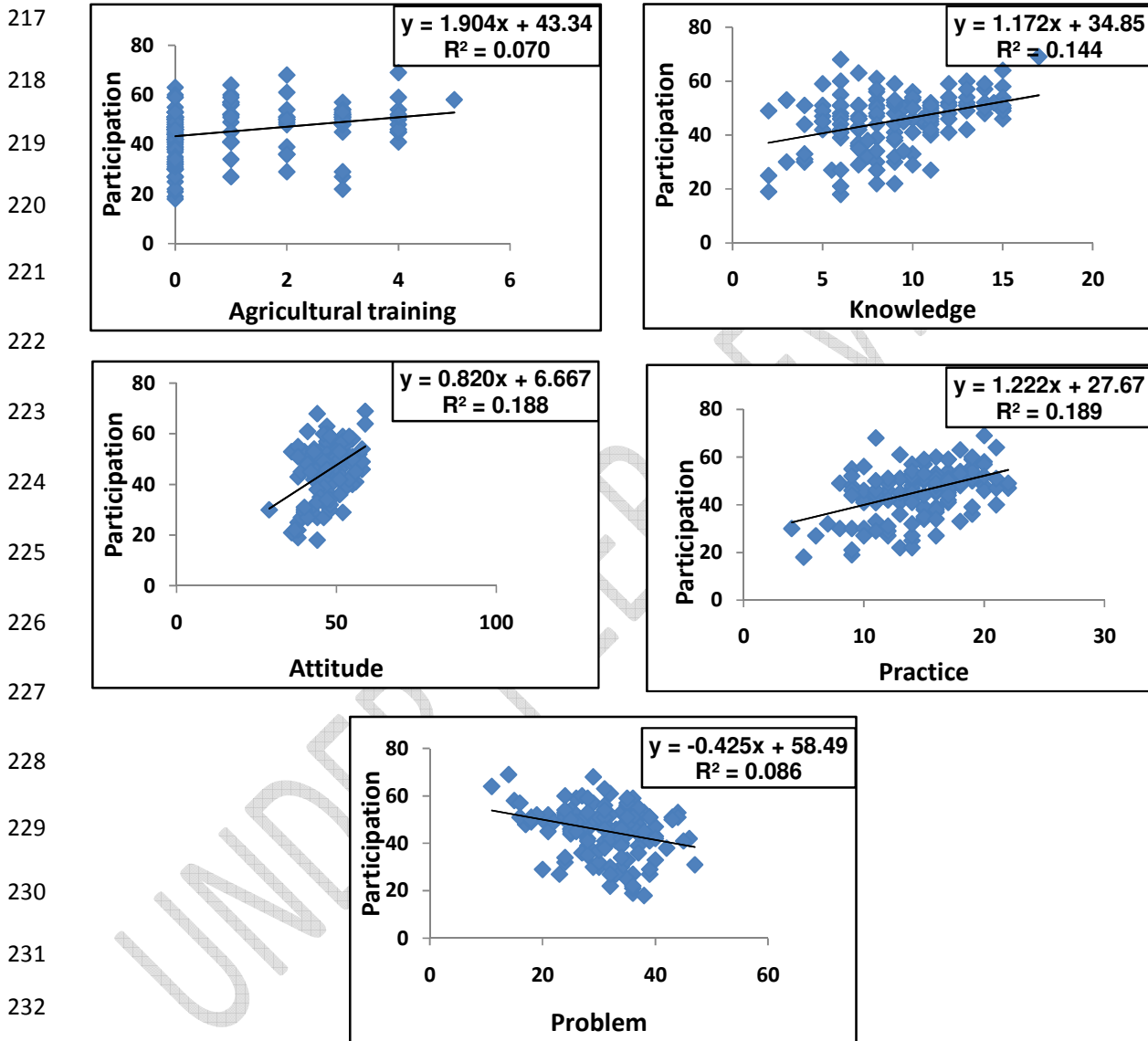
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214 **Table 5. Correlation coefficient between the selected characteristics of rural women and extent**
 215 **of women participation in organic farming**

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}	<i>r</i>
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 ^{**}	

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



234 **Figure 1: Simple regression analysis of training, knowledge, attitude, practice and problem on**
 235 **participation of rural women in organic farming**

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239 **4. CONCLUSION**

240 Based on the results and its logical interpretation it can be concluded that highest proportion of rural
241 women had medium (52.1%) to high (44.3%) participation in organic farming. Among 7-aspects of
242 participation the participation was highest in land management followed by harvesting, fertilizer
243 management, intercultural operation, seed management and collection of product while it was least in
244 marketing. In case of 24-issues under 7-aspects of organic farming, the highest dominant area of
245 participation by the women was collection of product from own residence. Agricultural training,
246 knowledge, attitude, practice showed a significant positive relationship with their participation in
247 organic farming. Thus, it might be concluded from the gist of findings mentioned above that,
248 participation of women in organic farming is still not satisfactory and necessary steps concerning
249 extension approach as well as adequate support should be provided to increase the participation by
250 ensuring barrier free participation of rural women in organic farming.

251

252 **COMPETING INTERESTS**

253 Authors have declared that no competing interests exist.

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