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RESEARCH ARTICLE

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PROBLEM CONFRONTED BY THE GROWERS IN SPICES CULTIVATION PRACTICE IN SHIBGANJ UPAZILA UNDER BOGURA DISTRICT

¹Md. Safiul Islam Afrad, ²Runju Akter and ³Dipanwita Bhattacharjee

¹Professor, Department of Agricultural Extension and Rural Development, Bangabandhu Sheikh Mujibur Rahman Agricultural University (BSMRAU); ²Former MS Student, Department of Agricultural Extension and Rural Development, BSMRAU; ³Consultant, Forestry Department, JICA, Tripura, India

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*Corresponding author:

Md. Safiul Islam Afrad

ABSTRACT

The main objective directed the present study was to identify the problem confronted by the growers in spices cultivation in Shibganj upazila under Bogura district. Three unions of the upazila were purposively selected based on the vicinity to the Spices Research Center, Bogura. Ninety growers were randomly selected from 270 spices growers in three unions of the upazila. Data were collected from selected growers using pre-tested interview schedule. Eleven selected characteristics of the growers were considered as independent variable whereas problems faced in spices cultivation was the dependent variable. Majority (67.8%) of the growers were middle aged, the highest portion (61.1%) of them belonged to primary level education. Major proportion (60.0%) of them had small family size, almost all of them (98.9%) possessed small to medium farm size, and huge majority (87.8%) of them earned up to \$2823 annually. About three-fourth (73.3%) of the farmers had medium extension contact, half of them (50.0%) had poor training experience while 40.0 percent of them had medium innovativeness. Huge majority (85.5%) of the farmers had small to medium spices cultivation area (up to 0.6ha) while almost three-fourth (72.2%) of them had medium to long durational (11 to above 20 years) practice of spices cultivation. Major three problems faced in spices cultivation practice identified were "higher price and inadequate supply of inputs", "lack of proper land management technology" and excessive pest and disease infestation". Vital suggestions from the growers to overcome the problems were "adequate supply of spices cultivation inputs", "improving knowledge spices cultivation" and "enhancing functional communication". Only family size of the growers showed significant positive relationships with their problem confrontation in spices cultivation practice.

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INTRODUCTION

Herbal by-products that add flavor and aesthetic, aromatic and therapeutic treatments to food, drink and other items are generally termed as spices (Kumar *et al.*, 2011). Spices may be either bark, buds, flowers, fruits, leaves, rhizomes, roots, seeds, stigmas and styles or the entire plant (Takeda *et al.*, 2008). Spices and condiments play quite an important role in the national economies of several spice-producing, importing and exporting countries of the world. Presently 109 kinds of spices are cultivated in the world but in Bangladesh only 27 are used and produced only 17. On the basis of area, yield, demand and availability, spices are divided into three categories viz. major, minor and exotic.

Major spices are regularly used in daily diet at large amount such as chili, onion, garlic, turmeric and ginger (Islam *et al.*, 2011). Spices provide means of earning living to many who operate on any of the activities within its value chain and are more profitable compared with other competing crops (CAST, 1984 and Elias and Hossain, 1984). In Bangladesh, the area under the spices cultivation is 0.4 million hectares with annual production of 2.5 million metric tons and the annual demand of spices seeds are 3.0 million metric tons. Spices cover almost 2.6 percent of total cropped area in Bangladesh. Recently, the production rate of major spices like onion, garlic, chili, turmeric and ginger are 0.174, 3.82, 0.130, 0.140 and 0.077 million metric tons, respectively (BBS, 2016). The average area and production of spice are increasing in Bangladesh. However, it is reported that shrinkage of land resources is a

limited scope to increase production of spices (Noor *et al.*, 2008). Several research organizations are involved in research to improve the production and quality of spices. For the last two decades, Bangladesh Agricultural Research Institute (BARI) developed and released 18 (major-12, minor-6) disease resistance improved variety of spices. On the other hand, 81 technology on production, soil and water management; disease and insect management and post-harvest management have also been developed. BARI, Bangladesh Agricultural Research Council (BARC), Department of Agriculture (DAE) and NGO's have strengthened their works to extend these technology (Islam *et al.*, 2011). However, the Bangladesh national demand of spice consumption is much higher than production. Considering the importance of spices in Bangladesh, Spices Research Centre (SRC) was established under Bangladesh Agriculture Research Institute (BARI) in Shibganj upazila under Bogura district in 1996. So far 33 high-yielding varieties of 14 crop spices were invented along with 150 production technology, which detailed how the high-yielding varieties should be planted and grown to ensure high standard.

In this connection, there are some problems that retard the production of spices. For successful production of spices, it is very important to identify and solve production problems. Because, it is widely recognized that the higher the severity of problem, the lower the adoption of any technology. But there is dearth of research on problems of the growers in spices cultivation practice. If the production associated problems are identified and address properly, it would be easier for effective cultivation of spices. Therefore, the present study was undertaken to i) describe the socio-economic characteristics of the spices growers in the study area ii) identify the problem faced by the growers in spices cultivation practice in the selected study area and iii) find out the relationships between socio-economic characteristics of the respondents and their problem confrontation in spices cultivation practice.

METHODOLOGY

The descriptive and diagnostic research design was used in the present study. The study was conducted in three unions (Shibganj Sadar, Mokamtala, and Bihar) of Shibganj upazila under Bogura district. Shibganj upazila of Bogura district was selected as because spices are widely distributed in this area. For further clarity about locale of this study. All the spices cultivators of the selected three unions of Shibganj upazila under Bogura district constituted the population of this study. Total number of the spices cultivators in the three unions was 270 that constituted population of the study. In this study, 90 farmers were selected as sample following random sampling technique. In order to collect relevant information from the respondents, an interview schedule was carefully designed keeping the objectives of the study in view. The schedule contained both open and closed form questions. Data were collected by the researchers during October to December 2018. The independent variables of the study were the selected characteristics of the respondent viz. age, education, family size, farming experience, farm size, training experience, innovativeness, annual income and extension contact while knowledge on spices cultivation technique and associated problems were the dependent variables. Age, education of the respondents was measured in actual year and categorized following (Rahman, 2008) and training experience following (Wadud, 2010). Family size was measured in numbers of total

member and farm size in hectare following Islam (Islam, 2008 and BBS, 2009). Annual family income was calculated in USD, innovativeness in observed score, farming experience in years, extension contact in observed score and categorized following observed mean and SD. Eight problems were identified from their along with the extent of severity of these problems in a four continuum scale. For measuring the extent of problem confrontation, scores of '4', '3', '2' and '1' were assigned against the responses of 'very severe problem', 'severe problem', 'moderate problem' and 'low problem', respectively. For clear understanding the severity of individual problem, 'problem confrontation index (PCI)' was calculated by multiplying the frequencies of responses with their allied scores and then added together to get a total number following the formula given by (Afrad, et al., 2004).

$$PCI = VSP \times 4 + SP \times 3 + MP \times 2 + LP \times 1$$

Where, VSP= Very severe problem, SP=Severe problem, MP=Moderate problem, LP=Low problem

RESULTS AND DISCUSSIONS

This section has been described the following sub-sections as per objectives of the study.

Selected characteristics of the respondents: Out of eleven socioeconomic characteristics of the respondents nine have been presented in Table 1. Results shown in Table 1 indicate that big majority (67.8%) of the respondents were middle aged followed by (18.9%) were young aged and 13.3 percent were old aged, respectively. Highest portion (61.1%) of the respondents had primary level education, 32.2 percent respondents had secondary level of education and 3.3 percent respondents had higher secondary level education compared to 3.3 percent respondents were illiterate. The highest proportion (60.0%) of the respondents had small family size while 38.9 percent had medium family size and only 1.1 percent had large family size. The highest proportion (51.1%) of the respondents possessed medium farm size while 47.8 percent and 1.1 percent possessed small and large farm size, respectively. The highest proportion (47.8%) of the respondents had low income while 40.0 percent had medium and 12.2 percent had high income. Vital majority (73.3%) of the respondents had medium extension contact while 14.4 percent had high extension contact and 12.2 percent had low extension contact. Most of the respondents (50.0%) had poor training experience whereas 17.8 percent did not have any training at all in compare with 25.6 percent had medium and only 6.7 percent had high training experience. The highest proportion (40.0%) of the respondents had medium innovativeness and 24.4 percent had high innovativeness, 22.2 percent had low innovativeness and 13.3 percent had very high innovativeness.

Area under spices cultivation: The mean and standard deviation of spices cultivation area were 0.41 ha and 0.1, respectively. Based on innovativeness scores, the respondents were classified into three categories. Information presented in Table 2 indicate that the majority (43.3%) of the respondents had small cultivation area while the more or less same portion of the (42.2%) had medium and 14.4 percent had large spices cultivation area. Therefore, more than four-fifth (85.5%) of the respondent belonged to small to medium spices cultivation area.

Table 1. Selected characteristics of the respondents growers

Variables (Unit of measurement)	Score range		Categories	No.	%	Mean	SD
	Possible	Observed					
Age (Years)	Unknown	28 to 56	Young (22 to 35)	17	18.9	42.09	-
			Middle (36 to 50)	61	67.8		
			Old (51 and above)	12	13.3		
Education (Schooling years)	Unknown	0-12	Illiterate (0)	3	3.3	5.32	3.06
			Primary (1 to 5)	55	61.1		
			Secondary (6 to 10)	29	32.3		
			Higher secondary (above 10)	3	3.3		
Family size (Number)	Unknown	2-8	Small (<5)	54	60.0	4.32	1.29
			Medium (5-7)	35	38.9		
			Large (above 7)	1	1.1		
Farm size (ha)	Unknown	0.53 to 4.008	Small (0.02 to 1.01)	43	47.8	1.03	0.43
			Medium (above 1.01 to 3.03)	46	51.1		
			Large (above 3.03)	1	1.1		
Annual income (USD)	Unknown	941 to 4117	Low (up to 1306)	43	47.8	1752.7	-
			Medium (1307-2823)	36	40		
			High (above 2823)	11	12.2		
Innovativeness (Score)	1-4	1-4	Low (1)	20	22.2	2.29	-
			Medium (2)	36	40.0		
			High (3)	22	24.5		
			Very high (4)	12	13.3		
Farming experience (Years)	Unknown	10-32	Low (1 to 10)	6	6.7	21.10	7.24
			Medium (11 to 20)	36	40.0		
			High (above 20)	48	53.3		
Training experience (Days)	Unknown	0-8	No (0)	7	7.7	3.58	-
			Poor (1-3)	33	36.7		
			Medium (4-5)	33	36.7		
			High (above 5)	17	18.9		
Extension contact (Score)	0-12	5-11	Low (1 to 5)	11	12.2	8.42	1.61
			Medium (6 to 10)	66	73.3		
			High (above 10)	13	14.5		

Table 2. Distribution of the respondents based on their spices cultivation area

Categories	Respondents		Mean	SD
	Number	Percent		
Small spices cultivation area (0.10 to 0.30 ha)	39	43.3	0.41	0.13
Medium spices cultivation area (0.31 to 0.60 ha)	38	42.2		
Large spices cultivation area (above 0.60 ha)	13	14.5		
Total	90	100.0		

Table 3. Distribution of the respondents based on their duration of practicing spices cultivation

Categories	Respondents		Mean	SD
	Number	Percent		
Short durational <i>practice</i> (1 to 10 years)	25	27.8	17.58	6.76
Medium durational <i>practice</i> (11 to 20 years)	36	40.0		
Long durational <i>practice</i> (above 20 years)	29	32.2		
Total	90	100.0		

The findings clearly indicate that most of the respondent farmers had small to medium spices cultivation area. This might be due to their possession of total small land holdings.

Duration of practicing spices cultivation: Based on the age of practicing spices, respondents were classified into three categories (Table 3). The mean and standard deviation of spices practicing were 17.58 years and 6.76, respectively. Results presented in Table 3 indicate that the majority (40.0%) of the respondents had medium durational practice of spices cultivation while 32.2 percent had long and 27.8 percent had short durational practice of spices cultivation. Therefore, it is clearly indicated that almost three-fourth (72.2%) of the respondent farmers had medium to long durational practice of spices cultivation. This might be due to high income from spices cultivation, tradition of area and familiar cultivation technique.

Problem faced in spices cultivation practice: Farmers faced different problems in cultivating of spices, of which, 8 problems were identified as hindrance in adopting the spices variety. For clear understanding of the fact, a problem confrontation index (PCI) were used which is shown in Table 4. The results indicate that major problem in cultivating spices was the higher price and inadequate supply of inputs, lack of proper land management Technology, lack of seedling materials and fertilizer, lack of rain or proper irrigation, pest and disease infestation, Losses due to natural calamities, less profitable in compare to cereal cultivation, and less yield than other popular varieties. Almost similar findings were also reflected in the study of (Hedayet, 2011). The mean and SD of the observed problem confrontation in spices cultivation practice scores of the respondents were 19.52 and 1.52, respectively (Table 5). The respondents were classified into two categories based on their observed problem confrontation in spices cultivation practice score.

Table 4. Ranking of the problems faced by the respondents growers in spices cultivation

Sl#	Nature of problem	Degree of problem (n= 90)					PCI	Rank
		*VH(4)	H (3)	M (2)	L (1)	NAA (0)		
1	Higher price and inadequate supply of inputs	82	8	0	0	0	352	1st
2	Lack of proper land management Technology	29	33	28	0	0	271	2nd
3	Less yield than other popular varieties	7	30	36	8	9	198	8th
4	Losses due to natural calamities	10	48	30	2	0	246	6th
5	Lack of seedling materials and fertilizer	11	68	9	2	0	268	3rd
6	Less profitable in compare to cereal cultivation	10	41	33	6	0	235	7th
7	Lack of rain or proper irrigation	15	52	14	9	0	253	4th
8	Pest and disease infestation	18	35	37	0	0	251	5th

*VH=Very high, H=High, M=Moderate, L= Low, NAA= Not at all

Table 5. Distribution of the respondents according to their confrontation in spices cultivation practice

Variables (Unit of measurement)	Score range		Categories	Respondents		Mean	SD
	Possible	Observed		No.	%		
Problem confrontation in spices cultivation practice	8-32	17-21	Low (up to 18)	22	24.4	19.52	1.52
			Moderate (19 to 21)	68	75.6		

Table 6. Ranking of the suggestion provided by the spices growers

Sl#	Suggestions	Number (n=90)	Percent	Mean	SD	Rank
1	Adequate supply of inputs	24	26.7	3.36	1.92	1st
2	Availability of HYV	12	13.3			4th
3	Knowledge update	13	14.5			3rd
4	Pest and disease control	9	10.0			5th
5	Improved market structure	13	14.5			3rd
6	Enhanced communication system	19	21.1			2nd

From Table 5 it is observed that more than three-fourth (75.6%) of them belonged to moderate problem confrontation in spices cultivation practice category and the rest i.e. approximately one-fourth (24.4%) were in the low problem confrontation in spices cultivation practice category. Therefore, the whole portion (100.0%) of the respondent belonged to the low to moderate categories of problem confrontation in spices cultivation practice. None of them were found facing high or severe category of problem confrontation in spices cultivation practice. This might be due to their insufficient contact with extension personnel and lack or no training experience in the field asked for. The respondents were asked to give their suggestions to overcome to the problems they encountered in spices cultivation practice. So far six suggestions were offered by the respondents. Rank order of the individual suggestions were prepared based on their frequencies and percent and shown in Table 6. Results indicate that vital suggestions in cultivating spices were the adequate supply of inputs (26.7%), proper communication system (21.1%), knowledge update (14.4%), improved market system (14.4%), availability of HYV (13.3%), pest and disease control (10.0%). First suggestion is adequate supply of inputs that means the farming materials such as seed, fertilizer, pesticide and etc. should be available for farmers. Second suggestion is proper communication system that means the communication of farmers with extension workers or others should be enhanced so that they can get necessary services at any time. Third suggestion is knowledge update that means the farmers should keep up to date knowledge on spices cultivation.

Relationship between the selected characteristics of the respondents and their problem confrontation in spices cultivation practice: Correlation coefficient 'r' was calculated to find out the relationship between problem confrontation in spices cultivation and selected socioeconomic characteristics of the respondents. The summary of the correlation analysis has been shown in Table 7.

Table 7. Relationship between of the selected characteristics of the respondents and their problem confrontation in spices cultivation practice

Independent variable	Dependent variable	Coefficient of correlation (r)
Age	<i>Problem confrontation in spices cultivation practice</i>	0.161 ^{NS}
Education		-0.043 ^{NS}
Family size		0.263*
Farm size		0.099 ^{NS}
Extension contact		0.061 ^{NS}
Farming experience		0.183 ^{NS}
Training experience		-0.160 ^{NS}
Innovativeness		0.014 ^{NS}
Annual family income		0.076 ^{NS}
Area under spices cultivation		0.034 ^{NS}
Duration in spices cultivation		0.098 ^{NS}

*Significant at 0.05 level of probability, NS=Non-significant

Results shown in Table 7 indicate that all of the eleven selected variables had non-significant relationship with problem confrontation of the growers in spices cultivation except family size. Though age, family size, farm size, extension contact, farming experience and innovativeness and annual family income were positively correlated but education and training experience were negatively correlated. Family size of the respondent showed significant positive relationship with their problem confrontation in spices cultivation. It means, the higher the number of the family member, the greater the severity of problem confrontation in spices cultivation. Usually, when there is a higher scope of larger rural family to be involved with agricultural activities. But in this case, all the family members might not be interested to support spices cultivation activities. This might be due to their involvement in other on-farm or off-farm activities. But non-significant positive relationship between problem confrontation and family size of oilseed growers and organic farming practitioners were also reported (Pervin et al., 2018 and Biswas and Islam, 2019).

CONCLUSIONS

Based on the major findings and their logical interpretations several conclusions have been put forward. Majority of the growers were middle aged, having primary level education, small family size, medium farm size, low annual income, medium extension contact, poor training experience, medium innovativeness and medium level of knowledge on spices cultivation practice. Most of them possessed medium to small sized farm. Most of the farmers had small to medium spices cultivation area and almost three-fourth of them had medium to long durational practice of spices cultivation. Higher price and inadequate supply of inputs, lack of proper land management technology, less yield than other popular varieties, losses due to natural calamities, lack of seedling materials and fertilizer, less profitable in compare to cereal cultivation, lack of rain or proper irrigation, pest and disease infestation were the major problems faced by the farmers in cultivating spices. Vital suggestions offered by the growers to overcome the problems were adequate supply of spices cultivation inputs, improving knowledge spices cultivation and enhancing functional communication system. None of the selected characteristics of the growers but family size showed significant relationships with their problem confrontation in spices cultivation practice.

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