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Farmers' Problem Confrontation Towards Seed Potato Production

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Abstract

The objectives of the study were to (i) determine the farmers' problem confrontation towards seed potato production, (ii) describe the selected characteristics of the farmers and (iii) explore the relationships between the selected characteristics of the farmers and their problem confrontation towards seed potato production. The selected characteristics of the seed potato growers were age, education, farm size, annual income, experience in potato production, training experience, extension media contact, innovativeness and knowledge on potato production. Data were collected from 105 randomly selected respondents of the three villages under Kushtia Sadar Upazila of Kushtia District by using interview schedule. Thirteen types of problems in regard of seed potato production were considered for measuring the farmers' problem confrontation towards seed potato production. According to problem confrontation index (PCI), the first five problems recognized most important among the thirteen problems were lack of quality seed (256), disease problem (215), insect problem (190), high price of quality seed (176) and lack of knowledge on quality seed potato production (168).

The findings of the study revealed that more than three-fourth of the farmers (76.19%) had medium problem confrontation towards seed potato production while 12.38% had high problem and 11.43% had low problem confrontation towards seed potato production. Co-efficient of correlation was computed to explore the relationship between the selected characteristics of the farmers and their problem confrontation towards seed potato production. Experience in potato production, training experience, extension media contact, innovativeness and knowledge on potato production of the farmers had negative significant relationships with their problem confrontation towards seed potato production. On the other hand, age, education, farm size and annual income of the farmers had no significant relationship with their problem confrontation towards seed potato production.

Keywords: Farmer, Problem confrontation, Seed potato production

1. Introduction

Potato is the second largest food crops in Bangladesh after the rice and therefore contributes much to the total food supply of the country. Potato is a very popular tuber crop in Bangladesh mainly used as vegetable but there is a great opportunity to use it as the substitute of the staple food of rice to ensure food security of the country if food habit can be changed. Country's Rapid population expansion followed by shrinkage of cultivable land necessitates increased yield of food crops to keep pace with growing demand. Tuber crops like potato provide highest number of calories per unit of land (Rahman, 1990). In this context, by increasing potato production vertical expansion of food production can be possible.

Climate and soil of Bangladesh are suitable for potato cultivation. At present 395.55 thousand hectares of cultivable land is under potato cultivation and the country produced 5268 thousand tons potato in the year 2008-2009 (BBS 2009). The area under potato cultivation is increasing day by day. The average yield of potato per hectare is 13.32 t/ha which is very low in comparison to other potato producing countries (43.2 t/ha in France, 44.7 t/ha in Netherlands and 44.6 t/ha in the USA in 2007; Anonymous 2008). Low quality seed is one of the major problems for potato cultivation in Bangladesh. By using low quality seeds, farmers often get low yield and loose their substantial portion of the investment. If seed potato quality can be improved, production can be doubled. At the rate of 1.5 t/ha, seed potato requirement per year is approximately 0.6 million tons. Both private and public sector together supply only 5% quality seed of the total requirement (Karim, 2009). Rest 95% is the low quality seed potato which is produced by the farmers themselves. Farmers are facing various problems to produce seed potato like lack of quality seed, disease problem, insect problem, high price of quality seed, lack of knowledge on quality seed potato production etc. So, it is inevitable to know the nature and extent of problems that farmers are being confronted to produce seed potato and explore relationships between problem confrontations with their selected characteristics.

2. Objectives of the study:

(i) to determine the farmers' problem confrontation towards seed potato production ,

(ii) to describe the selected characteristics of the farmers and

(iii) to explore the relationship between the selected characteristics of the farmers and their problem confrontation towards seed potato production.

3. Materials and Methods

Three villages namely Koburhat, Vadalia, Boaldhoha under Kushtia sadar Upazila of Kushtia District were purposively selected as the locale of the study. The total number of the seed potato growers (300) in the study area was considered as the population of the study. One hundred and five farmers were randomly selected at the rate of 35% as sample from the total population. Data were collected through face-to-face interview by using structured interview schedule from the selected respondents of the study area during 01 March to 31 March 2011. The methodology followed for measuring the dependent and independent variables are described below:

3.1 Measurement of independent variables

The characteristics of the farmers such as age, education, farm size, annual income, experience in potato production, training experience, extension media contact, innovativeness and knowledge on potato production were the independent variables of the study. Age of a farmer was measured in terms of actual years from his birth to the time of interview. The education of a farmer was measured in terms of formal years of schooling. The area possessed by the farmers under farm and homesteads were the

basis for calculation of farm size. Annual income was measured considering the total yearly earnings from agriculture and non agricultural sources of the members of a respondent's family. Experience in potato production was measured on the basis of respondent's years of involvement potato cultivation. Training experience was measured by the total number of days a respondent received training in his entire life under different agricultural training programs. Extension media contact was measured on the basis of extent of use of 18 communication media of different nature by using four points (0-3) rating scale. Innovativeness of the farmers was measured on the basis of their adoption of 10 new technologies related to agriculture and others considering earliness in the use of a technology by a farmer by using four points rating scale. The knowledge on potato production score of a farmer was measured by asking him 15 questions on different aspects of potato production. For correct response to a question, a respondent could get a score of 2, while for wrong response he could get 0 (zero) and for partial correctness of the reply he could get partial credit.

3.2 Measurement of dependent variable

Problem confrontation was the dependent variable of the study. It was measured by using a four point rating scale. Thirteen problems on different aspects of seed potato production were identified to measure problem confrontation of the farmers after consultation with concerned experts, researchers and reviewing available resources. For each problem, score of 3, 2, 1 and 0 were assigned to indicate high problem, medium problem, low problem and no problem at all respectively. The problem confrontation score was computed for each respondent. The possible range of total score for 13 problems could be 0 (zero) to 39, while '0' indicating no problem confrontation and '39' indicating high problem confrontation in seed potato production. To identify the most important problem confrontation, Problem Confrontation Index (PCI) was computed using the following formula:

$PCI = P_h \text{ X } 3 + P_m \text{ X } 2 + P_l \text{ X } 1 + P_n \text{ X } 0$

Where,

PCI = Problem Confrontation Index

P_h = Number of seed potato producers having high problem

P_m = Number of seed potato producers having medium problem

P_l = Number of seed potato producers having low problem

P_n = Number of seed potato producers having no problem

4. Result and Discussion

4.1: Selected Characteristics of the Farmers

In this section, the findings on the farmers' selected characteristics have been discussed and a summary profile of these characteristics is presented in table 1, which indicates an overwhelming majority (79.05%) of the respondents belonged to middle and young aged categories except a few (20.95%), among which 80.95% had education ranged from primary to secondary, above the national average. Most of the respondents (92.38%) belonged to small to medium farm.

The highest proportion (90.48%) of the farmers had low to medium annual income whereas only 9.52% farmers had high annual income. A very big proportion of (85.71%) of the respondents had low to medium experiences in seed potato production while only 14.29% had high experiences in potato production. Most of the (92.38%) respondents had low to medium training experiences. The tabulated data indicate that 82.86% of the respondent had low to medium extension media contact with various information sources and only 17.14% had high extension media contact. More than two thirds (78.09%) of the respondents had medium innovativeness while 11.43% had low and only 10.48% had high innovativeness. The tabulated data indicate that more than three fourth (81.91%) of the respondents had medium knowledge on potato production while only 12.39% of them had high knowledge on potato production.

4.2: Farmers' problem confrontation towards seed potato production

Table 2 shows farmers' problem confrontation towards seed potato production. There are different types of problems farmers confronted in seed potato production such as lack of quality seed potato, disease problem, insects problem, high price of quality seed potato, lack of knowledge on quality seed potato production, storage problem etc. Thirteen of such problems were considered to measure their

problem confrontation. The observed problem confrontation score of the respondents ranged from 8 to 36, average being 20.35 and standard deviation 6.11.

Data presented in Table 2 also revealed that more than three fourth (76.19%) of the seed potato growers confronted medium problems, while 12.38% confronted high problem and 11.43% low problem. Problems regarding to seed potato production were ranked based on their PCIs and presented in Table 3 to identify severity of the problems which indicate that the problem which ranked first was "lack of quality seed potato" with a PCI of 256. Lack of quality seed is a major problem because public and private sector organizations of Bangladesh supply negligible amount of quality seed. On the other hand, most of the farmers used farmers level produced seed potato which quality is not up to the mark due to not strictly following quality seed production procedures and many of them used table potato as seed potato. Probably for these reasons farmers indicated lack of quality seed potato as problem and it comes first in rank order.

The second problem was "disease problem" with the PCI of 215. Different diseases of potato are major constraints for quality seed potato production. Diseases like potato leaf roll virus, mosaic virus, bacterial wilt, late blight of potato etc. are obstacles of quality seed potato production. Some of these diseases are seed born and some of them are soil born and further disease dissemination enhanced by insect vectors and not maintaining proper isolation distance. To overcome these problem, use of disease free seed potato, schedule spraying of pesticide, proper rouging and maintaining isolation distance are inevitable but lack of knowledge and other socioeconomic reasons farmers failed to take such actions. Thus disease problem comes second in rank order.

Like disease, insects' infestation is one of the major problems in seed potato production. Aphids transmit several pathogens of viral diseases from plants to seeds and cause degeneration of seed potato. To control aphid, schedule spray of systemic insecticides and adjustment of planting time are required that farmers often failed to maintain. Besides, cutworm is another pest which causes significant damage to seed potato but totally controllable by applying proper insecticide.

High price of quality seed potato is a problem which ranked fourth. According to Fakrul *et al*. (2000) cost of tuber seed is an important constraint in potato production. It accounts 35 to 40 percent of total production cost which is much higher than any other crops. Other subsequent problems were lack of knowledge on quality seed potato production, seed storage problem, high price of fertilizer and pesticide, irrigation problem etc.

4.3: Relationship between selected characteristics of the farmers with their problem confrontation towards seed potato production

Table 4 shows the relationship between the selected characteristics of the respondents with their problem confrontation towards seed potato production. Co-efficient of correlation results revealed that out of 9 selected characteristics of the respondents only 5 namely experience in potato production, training experience, extension media contact, innovativeness and knowledge on potato production had significant negative relationships with their problem confrontation towards seed potato production which indicate that more of these characteristics of the farmers, the less they face constraints in seed potato production. The possible reasons might be higher level of these characteristics induce and facilitate individuals to receive more information on seed potato production which helps individuals to increase his/her understanding and skill on different aspects of seed potato production. Aziz (2006), Rahman (2006) also found similar relationships.

On the other hand, age, education, farm size, annual income of the respondents had no significant relationships with problem confrontation towards seed potato production. Afrad *et al.* (2004) also explored similar relationships except education.

5. Conclusion

On the basis of data analysis and their logical interpretation, the study revealed that majority (76.19%) of the respondents had medium problems in seed potato production. The nature of problems may vary from region to region but the overall problems will be more or less similar throughout the country. Under the existing circumstances, it may be concluded that so long the seed potato growers have considerable problems they would not be able to produce quality seed potato. To overcome existing problems following steps can be taken:

1. Production and supply of quality seed potato should be increased through strengthening private and public sectors enterprises so that farmers can able to replace their existing seeds with quality seed for seed potato production.
2. To remove viral diseases, tissue culture technology should be disseminated so that farmers can get virus free potato plantlets which they can cultivate within net house for preventing insect vectors to produce quality seed potato. Besides, research institutes should take initiatives to develop high yielding resistance varieties of potato.
3. Concerned authorities and diffusion agencies should give proper attention to disseminate sustainable seed potato production technologies through arranging farmers training followed by establishing seed potato demonstration plots at farmers field adequately.
4. Seed potato growers should be given credit facilities in easy terms and conditions to buy their input materials. Besides, sufficient cold storage facilities should be developed in potato producing areas for preservation of their seed potato by utilizing cooperative effort or public-private partnership approach.

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Appendix

Table 1. The characteristics profile of the sample farmers

Characteristics	Probable range	Observed ranged	Category	Number (N=105)	Percent	Mean	SD
Age (Years)	Unknown	22-68	Young aged (up to 35)	23	21.91	40.35	7.15
			Middle aged (36-50)	60	57.14		
			Old aged (≥51)	22	20.95		
Education (Year of schooling)	Unknown	0-14	No education (0 or 0.5)	8	7.62	7.50	4.25
			Primary education (1-5)	30	28.57		
			Secondary education (6-10)	55	52.38		

			Above secondary (>10)	12	11.43		
Farm size (Hectare)	Unknown	0.18-6.50	Small farm (>1.00 ha)	65	61.90	1.15	0.58
			Medium farm (1.00-3.00 ha)	32	30.48		
			Large farm (>3.00 ha)	8	7.62		
Annual income ('000 Tk.)	Unknown	75-750	Low income (<150)	25	23.81	1.75	65.44
			Medium income (150-350)	70	66.67		
			High income (>350)	10	9.52		
Experience in potato production (Years)	Unknown	2-9	Low (<5)	35	33.33	6.23	2.25
			Medium (5-7)	55	52.38		
			High (>7)	15	14.29		
Training experiences (Days)	Unknown	0-20	Low (0-5)	85	80.95	2.75	6.24
			Medium (6-12)	12	11.43		
			High (>12)	8	7.62		
Extension media contact (Rated score)	0-54	10-50	Low (<15)	15	14.29	22.33	8.55
			Medium (15-35)	72	68.57		
			High (>35)	18	17.14		
Innovativeness (Rated score)	0-30	8-28	Low innovativeness (<15)	12	11.43	19.15	4.25
			Medium innovativeness (15-22)	82	78.09		
			High innovativeness (>22)	11	10.48		
Knowledge on potato production	0-30	8-28	Low knowledge (<15)	6	5.70	19.25	3.55
			Medium knowledge (15-22)	86	81.91		
			High knowledge ((≥22)	13	12.39		

Source: Own study

Table 2. Distribution of the respondents according to their problem confrontation in seed potato production

Category	Number	Percent	Mean	SD
Low (>14)	12	11.43	20.35	6.11
Medium (14-26)	80	76.19		
High (>26)	13	12.38		
Total	105	100		

Source: Own study

Table 3. Rank order of the problems confronted by the farmers in seed potato production

Sl. No.	Statements on problems	Problem confrontation index (PCI)	Rank order
1	Lack of quality seed potato	256	1
2	Disease problem	215	2
3	Insects problem	190	3
4	High price of quality seed potato	176	4

5	Lack of knowledge on quality seed potato production	168	5
6	Seed storage problem	162	6
7	High price of fertilizer and pesticide	156	7
8	Irrigation problem	148	8
9	Unavailability of seed potato in proper time	136	9
10	Low yield of seed potato	126	10
11	Marketing problem	108	11
12	Short duration of winter season	62	12
13	Late monsoon	46	13

Source: Own study

Table 4. Co-efficient of correlation between selected characteristics of the seed potato growers and their problem confrontation

Farmers' characteristics	Correlation Coefficient ('r') with the confronted problems
Age	-0.039
Education	-0.056
Farm size	-0.049
Annual income	-0.101
Experience in potato production	-0.274**
Training experience	-0.315**
Extension media contact	-0.498**
Innovativeness	-0.211*
Knowledge on potato production	-o.288**

Source: Own study

* Significant at 0.05 level of probability, ** Significant at 0.01 level of probability

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