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Constraints faced by the farmers in commercial cultivation of vegetables

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Abstract

The study was conducted to determine the constraints faced by the farmers in commercial cultivation of vegetables and to explore relationship between the selected characteristics of the farmers and constraints faced by them. Data were collected through personal interview from 142 randomly selected respondents out of 1422 vegetable growers of the three villages viz. Panchpara, Bagan and Rampur, under Trishal Upazila of Mymensingh district during January to March 2011. In terms of overall constraints the highest portion (83.30%) of the respondents faced medium constraint. Based on constraint facing index (CEI), low price of vegetables during harvesting ranked first followed by lack of quality seed and high wages of labourer. Among the ten selected characteristics, level of education, family size, farm size, extension media contact, knowledge on vegetable production and cosmopoliteness showed significant negative correlation and family subsistence pressure showed significant positive correlation with farmers' constraints in commercial cultivation of vegetables. Stepwise multiple regressions showed that extension media contact, cosmopoliteness and knowledge on vegetable production had greater influence on farmers' constraints.

Keywords: Farmers' constraints, Vegetables, Commercial cultivation

Introduction

Bangladesh is an agrarian country. Agriculture is the economic backbone of the country. Subsistence farming is traditionally practised by the farmers. So, there is no cost-benefit calculation. But nowadays, Bangladesh agriculture is in transition from subsistence to commercial agriculture. Many entrepreneurs are investing in agriculture. Farmers are commercially cultivating crops specially vegetables. During the last decade, both area and production of vegetables increased manifold (AIS, 2001 and 2011). Vegetables, as high value crops, often require an intensive input regime, necessitating large labour input in planting and harvesting. In Bangladesh, higher profit variability in commercial cultivation of vegetables is evident due to variability in yields and market prices (Weinberger and Genova II, 2005). It is reported that due to various constraints farmers are not getting expected benefit from their investment. Moreover, constraints vary from one farmer to another due to influence of various factors (Rahman *et al*., 2008-10). However, this information is very essential for future planning and execution of any extension programme. Sporadic information is available in this regard. Hence, the present study was undertaken with a view

i. To describe the socio-demographic profile of the commercial vegetable growers;
ii. To determine the constraints faced by them in commercial cultivation of vegetables; and
iii. To study the relationship between their socio-demographic characteristics and constraints faced by them in commercial cultivation of vegetables.

Methodology

The study was conducted in three villages, namely Panchpara, Bagan and Rampur, under Trishal Upazila of Mymensingh district. The villages were selected purposively. The basis of the selection was availability of commercial vegetable growers. Total number of vegetable growers in three villages was 1422, which constituted the population of the study. Out of them 142 (10% of the total population) vegetable growers were selected randomly and proportionately from each of the three villages to constitute the sample. Data were collected from the respondents through direct interviewing method using a pre-tested structured interview schedule during January to March 2011.

Variables of the study

The independent variables of the study were ten selected socio-economic and demographic characteristics of the farmers. These were age, level of education, family size, farm size, annual income, family subsistence pressure (total number of family members per unit area (ha) of arable land), extension media contact, knowledge on vegetable production, cosmopoliteness and innovativeness. Appropriate methods were used to operationalize the independent variables by developing suitable scales.

Constraints faced by the farmers in selected 5 aspects, viz. availability of seed, pest management, field management, marketing and extension media contact in commercial vegetable cultivation were the dependent variable of the study. The dependent variables were measured by constructing scores for each of the five aspects. The scale contained five possible constraints which the farmer might face in respect of each of the five aspects of constraints in vegetable cultivation. Each of the farmers was asked to indicate the extent of difficulty caused by each of the constraint by checking any of the four responses such as, 'very high', 'high', 'little' and 'not at all' and weight was assigned to these responses as 3, 2, 1 and 0, respectively. Thus the possible score of each respondent could range from 0 to 15 in each aspect, 0 indicating no constraints and 15 indicates facing high constraints.

An overall constraint score for each respondent was computed by adding his constraints scores in all five aspects. Possible range of overall constraint score of the farmer could range from 0 to 75, while 0 indicating no constraint facing and 75 indicating high constraint facing. For clear understanding, the 25 aspects of constraints were arranged in a rank order by developing Constraint Facing Index (CFI) by using the formulae

$CFI = P_n \times 0 + P_l \times 1 + P_h \times 2 + P_{vh} \times 3$

Where, CFI = Constraint Facing Index

P_n = Percentage of farmers having no constraints

P_l = Percentage of farmers having little constraints

P_h = Percentage of farmers having high constraints

P_{vh} = Percentage of farmers having very high constraints

CFI for any aspect of constraint could range from 0 to 300, 0 indicating no constraint and 300 highest constraint.

Data analysis was performed by using the Statistical Package for Social Sciences (SPSS). Descriptive analysis such as range, number, percentage, mean, standard deviation and rank order were used whenever possible. Pearson's Product Moment Coefficient of Correlation was used in order to explore the relationship between the concerned variables. In order to have an understanding on the influence of independent variables on the dependent variable, stepwise regression analysis was conducted.

Results and Discussion

Selected characteristics of the vegetable growers

Data on socio-economic and demographic characteristics of the vegetable growers have been presented in Table 1. The highest portion (38.73%) of the farmers were middle aged, a substantial portion (35.21%) was young and about one-fourth (26.06%) of them were of old age category. Majority of the respondents (45.07%) had primary level of education while about 37% had secondary to above secondary level education. Only a few (18.31%) of them were illiterate. However, average literacy score of the respondents was 4.72. Medium sized family constituted the largest (35.92%) group of vegetable growers, which was followed by large (30.28%) families. Equal portion (16.90%) of the respondents had small and very large families. The average family size was 7.86. As regard to farm size, about half (46.48%) of the respondents were small farmer while 39.44% was medium farmer and 14.08% of the respondents was large farmer. Average farm size was 1.21 hectare. Respondents' annual income ranged from Tk. 36 thousand to 290 thousand with an average of Tk. 86.17 thousand. Fifty percent of the respondents were medium income category followed by high income (30.28%) and low income (19.72%) category. Family subsistence pressure score ranged from 2.20 to 19.0 with a mean score 9.49. Most of the respondents (48.59%) had high family subsistence pressure and the rest had medium (26.76%) to low (24.65%) family subsistence pressure. More than half of the respondents (55.63%) had medium extension media contact. A considerable portion (40.85%) of the respondents had low and only 3.52% had high extension media contact. Vegetable production knowledge score of the respondents ranged from 12-36 with an average of 26.61. About 56% of the respondents had medium level of vegetable production knowledge compared to 27.47% had high and 16.90% had low level of knowledge about vegetable production. Most (78.17%) of the respondents had medium level of cosmopoliteness compared to 16.90% had low and 4.93% had high level of cosmopoliteness. About half portion (49.30%) of the respondents had no innovativeness followed by low (42.25%) and only 8.45% had medium to high innovativeness.

Table 1. Distribution of the commercial vegetable growers according to their selected socio-economic and demographic characteristics

Characteristics	Scoring method	Possible score	Observed score	Categories	Respondents (N= 142)		Mean	SD
					Number	Percent		
Age	Number of years	-	30-70	Young (up to 35)	50	35.21	42	12.54
				Middle aged (36-50)	55	38.73		
				Old (>50)	37	26.06		
Level of education	Years of schooling	-	0-12	Illiterate (0)	26	18.31	4.72	3.35
				Primary level (1-5)	64	45.07		
				Secondary level (6-10)	38	26.76		
				Above secondary level (> 10)	14	9.86		
Family size	Number of members	-	2-19	Small (up to 4)	24	16.90	7.86	3.86
				Medium (5-7)	51	35.92		
				Large (8-10)	43	30.28		
				Very Large (>10)	24	16.90		
Farm size	Size in hectares	-	0.24-5.67	Small (0.21-1.0)	66	46.48	1.21	1.16
				Medium (1.01-3.0)	56	39.44		
				Large (> 3.0)	20	14.08		
Annual income	'000' Tk	-	36-290	Low income (up to 50)	28	19.72	86.17	49.37
				Medium income (50.1-100)	71	50.00		
				High income (>100)	43	30.28		
Family subsistence pressure	Score	-	2.20-19.0	Low (up to 5)	35	24.65	9.49	7.13
				Medium (6-10)	38	26.76		
				High (>10)	69	48.59		
Extension media contact	Score	0-45	2-21	Low (up to 10)	58	40.85	10.92	6.22
				Medium (11-20)	79	55.63		
				High (>20)	5	3.52		
Knowledge on vegetable production	Score	0-40	12-36	Low (up to 20)	24	16.90	26.61	6.32
				Medium (21-30)	79	55.63		
				High (>30)	39	27.47		
Cosmo- politeness	Score	0-18	6-12	Low (up to 7)	24	16.90	8.86	1.44
				Medium (8-14)	111	78.17		
				High (>14)	7	4.93		
Innovativeness	Score	-	0-21	No (0)	70	49.30	3.28	4.97
				Low (1- 10)	60	42.25		
				Medium (11-20)	8	5.63		
				High (>20)	4	2.82		

Constraints faced by the vegetable growers in different aspects

Constraint faced by the farmers in commercial cultivation of vegetables referred to the constraints in five selected aspects namely, availability of seed, pest management, field management, marketing and extension media contact. Data in Table 2 indicates that the majority (97.20%) of the respondents had medium to high constraints regarding the availability of seed. In respect of pest management, 41.7% of the respondents faced low constraints compared to 33.3% medium constraint and 25% faced high constraint. So, it is evident that more than half of the respondents faced medium to high constraint in this respect. Considering field management, most (91.6%) of the respondents faced medium constraint and also a few (2.8%) of them faced high constraint compare to only 5.6% faced low constraint. In respect of marketing, the highest portion (92.4%) of the respondents faced medium to high constraint and a few (7.6%) of them faced low constraint. Regarding extension media contact, one half of the respondents faced low constraint and the rest of them faced medium (33.3%) to high constraint (16.7%) in getting touch with extension media.

Overall constraints faced by the vegetable growers

Respondents were categorized on the basis of all the five aspects of constraints faced by them and data are presented in Table 3. Observed constraint score ranged from 18 to 52 with a mean of 38.06. Data reveal that the majority (88.90%) of the respondents faced medium to high constraint in commercial cultivation of vegetables. However, only 11.10% faced low constraint. It is a common observation that the greater is the constraint faced by any individual in any work the lesser is his progress in that work. It is, therefore, likely that farmers facing constraints in commercial cultivation of vegetables will have adverse effect on agricultural production. The findings of the study indicate that highest portion of the farmers faced medium to high level of constraints in different aspects of commercial vegetable cultivation. These facts indicate that the desired level of vegetable production and expected return will not be achieved if the different constraints faced by the farmers were not solved by the concerned authority.

Table 2. Categorization of the respondents according to their constraints in different aspects of commercial vegetable cultivation

Aspect of constraint	Category	Percentage of respondents	Mean	Standard deviation
Seed availability	Low constraint (up to 5)	2.8	8.23	1.79
	Medium constraint (6-10)	80.5		
	High constraint (11-15)	16.7		
Pest management	Low constraint (up to 5)	41.7	7.31	3.17
	Medium constraint (6-10)	33.3		
	High constraint (11-15)	25.0		
Field management	Low constraint (up to 5)	5.6	7.81	1.47
	Medium constraint (6-10)	91.6		
	High constraint (11-15)	2.8		
Marketing	Low constraint (up to 5)	7.8	8.36	1.86
	Medium constraint (6-10)	77.8		
	High constraint (11-15)	14.6		
Extension media contact	Low constraint (up to 5)	50.0	6.22	3.22
	Medium constraint (6-10)	33.3		
	High constraint (11-15)	16.7		

Table 3. Categorization of the respondents according to their overall constraints facing in commercial vegetable cultivation

Category	Percentage of respondents	Mean	Standard deviation
Low constraint (up to 25)	11.10	38.06	9.02
Medium constraint (26-50)	83.30		
High constraint (51-75)	5.60		

Comparison among the individual constraints faced by the vegetable growers

In order to measure farmers' extent of constraints facing in all individual 25 constraints, a constraint facing index (CFI) was developed. The computed CFI and associated rank order on the basis of CFI values taking all 25 constraint items have been presented in Table 4. Low price of vegetables during harvesting ranked first among the 25 characteristics in the study area followed by lack of quality seed, high wages of labourer and lack of storage facility. The most of the positions of the rank orders could be explained by the situation of the locality and existing potential for commercialization of vegetables cultivation. These problems could be mitigated through well designed extension programme towards improvement of commercial vegetable cultivation.

Relationship between the constraints faced by the vegetable growers with their selected characteristics

To find out the relationships between the selected characteristics of the vegetable growers and constraints faced by them in commercial cultivation of vegetables were computed which are presented in Table 5. Data revealed that level of education (-0.316**), family size (-0.376**) and farm size (-0.325**) of the respondents had significant negative correlation with the constraints faced by them. From the findings it is evident that level of education had strong influence on understanding of the problem and technological efficiency. Similar relationship was also observed by Rahman *et al.* (2005) between farmers' level of education and their problem confrontation in use of agricultural credit in potato cultivation. Family members of the respondents might contributed in different aspects of vegetable cultivation which exerted a positive impact on reducing the constraints. Large farmers come in contact more with different stake holders in doing their multiple activities of vegetable farming. This might be the reason that large farmers faced less constraint in commercial cultivation of vegetables. Kabir *et al*. (2011) also reported similar relationship between farm size and constraints faced by the nursery owners in the production of saplings.

Table 4. Rank order of 25 selected constraints faced by the farmers

Aspects of constraint	Constraint items	CFI	Rank order
Seed	Lack of quality seed	280.3	2
	Low germination	139.0	13
	Lack of knowledge of seed production	105.5	21
	High price of seed	172.3	5
	Lack of authentic source of seed	138.9	14
Pest management	Damaged by insect	161.1	7
	Lack of pest management training	141.6	12
	Damaged by disease	155.7	8
	High price of pesticide	152.8	9
	Elimination of diseased plant	88.9	25
Field management	High wage of labourer	197.1	3
	Lack of farm machinery	113.8	20
	Adverse weather	163.7	6
	Lack of capital/credit	136.1	15
	High price of fertilizer	144.6	11
Marketing	Lack of storage facility	174.9	4
	Low price during harvesting	280.5	1
	Faria/Middle man	114.1	19
	Lack of vehicle for carrying to distant market	133.4	16
	Lack of vegetable growers association	152.6	10
Extension media contact	Lack of training facility	122.2	18
	Lack of contact with extension agent	94.5	24
	Lack of demonstration plot	100.0	23
	Lack of information on commercial production of vegetable	127.9	17
	Lack of information of pest and soil management	102.7	22

Table 5. Relationship between respondents' selected characteristics and their constraint faced in commercial cultivation of vegetables

Dependent variable	Characteristics of the respondents	Calculated value of 'r'
Constraints faced by the farmers in commercial cultivation of vegetables	Age	- 0.003
	Level of education	- 0.316**
	Family size	- 0.376**
	Farm size	- 0.325**
	Annual income	- 0.125
	Family subsistence pressure	0.201*
	Extension media contact	- 0.774**
	Knowledge on vegetable production	- 0.639**
	Cosmo politeness	- 0.480**
	Innovativeness	- 0.027

* Significant at 0.05 level and ** significant at 0.01 level.

Family subsistence pressure was only the selected characteristic which showed significant positive relationship (0.201*) with constraints of vegetable cultivation. Higher family subsistence pressure indicates higher number of family members per hectare of land which exerts an extra pressure to the vegetable growers to maintain their family. Therefore, families having low subsistence pressure faced less constraints. The result is in agreement with the findings of Basak and Pandit (2011). They reported lower family subsistence pressure is well for formation of favourable attitude towards a new technology.

The correlation coefficient values between the respondents' extension media contact (-0.774**), knowledge on vegetable production (-0.639**), cosmopoliteness (-0.480**) and the constraints faced by them in commercial cultivation of vegetables were significant and negative. Respondents who had more contact with extension media acquired more knowledge on technological aspects which helped them to combat their constraints more efficiently. Similar relationship was also reported by Halim (2003) between farmers' extension contact and constraints faced by them in adopting crop diversification. Knowledge played a significant role on farmers' capability to overcome their constraints. Kabir *et. al.* (2011) also observed similar relationship between knowledge on nursery management and constraints faced by the nursery owners' in sapling production. The respondents more cosmopolite in nature might maintained more contact with places outside their social system and shared ideas regarding vegetable cultivation

issues which helped them to mitigate the constraints in commercial cultivation of vegetables to a large extent. Similar observation also reported by Nahid (2005) who found cosmopoliteness of the sugarcane growers had a significant negative relationship with problem confrontation by them in sugarcane production.

Stepwise multiple regression and contribution of the characteristics

An attempt was undertaken to determine farmers' characteristics (independent variables) in explaining their faced constraints in commercial cultivation of vegetables. Stepwise multiple regression analysis was done in order to have this understanding, results of which have been presented in Table 6. Out of eleven independent variables, three, namely, extension media contact, organizational participation and knowledge on vegetable cultivation entered into the regression equation. Thus, three models were found which separately showed the contribution of different combinations of variables into the dependent variable. Table 6 clearly indicates that extension media contact alone explained 59.6 percent of their constraints in commercial cultivation of vegetables. A combination of cosmopoliteness with extension media contact explained 67.0 percent of the dependent variable. Finally, farmers' vegetable production knowledge along with other two independent variables could explain 70.0% of their constraints. From the result of stepwise regression analysis, it may be concluded that farmers with more extension media contact, more cosmopoliteness and more knowledge on vegetable production can produce commercial vegetable with less constraint.

Table 6. Result of stepwise multiple regression analysis

Models	Entered independent variable	R^2	Adjusted R^2	Standard error of estimate
1	Extension media contact	0.599	0.596	5.67
2	Extension media contact + Cosmopoliteness	0.674	0.670	5.13
3	Extension media contact + Cosmopoliteness + Vegetable production knowledge	0.706	0.700	4.89

Conclusion

On the basis of the findings and their logical interpretation, it can be concluded that majority of the vegetable growers faced medium to high constraints regarding all the aspects under study except extension media contact. In respect of individual constraint low price of vegetables during harvesting, non availability of quality seed, high wages of labourer and lack of storage facility were the major ones. So, concerned authorities should take proper steps to minimize the constraints so that the commercial vegetable growers can get expected return from their investment.

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