

# Farmers' Attitude towards Environment Friendly Vegetable Cultivation

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**Abstract:** The main objectives of the study were to determine farmers' attitude towards environment friendly vegetable cultivation and to explore the relationship of the selected characteristics of the farmers. Besides, attempts were made to identify the constraints faced by farmer in relation to environment friendly vegetable cultivation. Data were collected from 100 randomly selected respondents of three selected villages of Kanakpur union under Sadarupazila of Moulvibazar district using a pre-tested interview schedule during February 10, 2018 to March 15, 2018. Farmers' attitude towards environment friendly vegetable cultivation was the dependent variable and dependent variable was measured by 20 statements on 5 point scale and the eleven selected characteristics of the respondents contributed in the dependent variable of the study. The highest proportion (40%) of the respondents had unfavorable attitude, 20% respondents had highly unfavorable attitude, 1% of them had neutral attitude while 33% respondents had favorable attitude and 6% had highly favorable attitude towards environment friendly vegetable cultivation. Pearson's Product Moment Correlation Coefficient(r) was used to explore the relationship between the dependent and independent variables. The correlation analysis found that education, training received, time spent in vegetable cultivation, annual family income, annual income from vegetable cultivation, knowledge on environment friendly vegetable cultivation, organizational participation and credit received had significant positive relationship with the farmers' attitude towards environment friendly vegetable cultivation. On the other hand, age, family size and farm size had no significant relationship with the farmers' attitude towards environment friendly vegetable cultivation. In respect of constraints faced by the farmers in relation to environment friendly vegetable cultivation, the findings revealed that the majority (70%) of the farmers faced medium constraints while 3% faced high and 27% faced low constraints during of environment friendly vegetable cultivation. Among the nine selected constraints, "lack of resistant variety" ranked first in the order while "criticize to other farmers for use of environment friendly practices" ranked last.

**Keywords:** Communication Media, Women Beneficiaries, Grameen Bank, AIGs

## 1. INTRODUCTION

Bangladesh is an agricultural country. According to Bangladesh Bureau of Statistics (BBS, 2015) about 47.30% of

the total population of this country is directly or indirectly involved in agricultural activities. Agriculture related sector contributes as much as 15.96% of the Gross Domestic Product (GDP) of the country (BER, 2015). Thus, agriculture plays a vital role in ensuring food security, employment generation, poverty alleviation, and raising standard of living and increasing export earnings. According to FAO, vegetable production has increased five times in the past 40 years. Bangladesh has scored 3rd in global vegetable production, next to China and India. The farmers are getting a huge profit from vegetable production which is changing their life. Literate youths are joining to the vegetable cultivation and are achieving targets with the use of improved technology and their talents. Vegetables are the cheapest source of vitamins, minerals and proteins which majority of people can buy easily. According to BBS 2010, vegetables are cultivated in 882127 acres of land and annual production of vegetable is only 2726723 metric tons (MT). According to Hossain et al. (1990), an adult person should eat at least 285 gm of vegetable per day for maintaining good health, but in Bangladesh an individual consumes only 70 gm per day.

The farmers of Bangladesh are mostly dependent on pesticides to control the pests. Use of pesticides is expensive with some negative environmental consequences and increased health hazards to the growers and consumers of vegetable products. It helps to develop pest resistance to insecticides, destroys beneficial insects and imbalances the natural position between the pests and their natural enemies leading to the increase in the population of the target pests and even creates new pest problems. To avoid such consequences and to increase the vegetable production at the same time, environment friendly practices are best for pest management. Environment friendly refers to those practices inflict minimum or no harm on the environment. Environment friendly vegetable cultivation is the process of producing vegetables naturally. This method avoids the use of synthetic chemicals and generally modified organisms to influence the growth of vegetables. The main idea behind environment-friendly vegetable cultivation is zero impact on environment.

Environment- friendly practices can make major positive impact on environment. Now a days government extension provider of Bangladesh, like DAE is working with projects all over the country. Every project has the major attention on environmental consideration in vegetable production by removal or reducing agro- chemicals. Among those projects a major and the largest type of project is Agricultural Extension Component (AEC), whose implementing agency is the Department of Agricultural Extension (DAE), associate agencies are Seed Wing, Agricultural Information Service (AIS) and On-Farm Research Division (OFRD) of BARI. OFRD involved in Farmers' Participatory Research activities in the project area. Some of the NGOs, private extension providers, provide various types of training on environment-friendly agricultural practice for their group members and ICM members, other than 140 days training for ICM farmers by ICM project both DAE and NGOs providing continuous training and other input facilities to the ICM members to increase their knowledge and to form a favorable attitude and adoption towards environment-friendly vegetable production. Environment friendly practices in vegetable cultivation used for managing pests are given below:

Biological control is the use of natural enemies-predators, parasites, pathogens and competitors to control pests and their damage. Invertebrates, plant pathogens, nematodes, weeds, and vertebrates have many natural enemies. Cultural controls are practices that reduce pest establishment, reproduction, dispersal and survival. For example changing irrigation practice can reduce pest problems, since too much water can increase root disease and weeds. Mechanical and physical controls kill a pest directly, block pests out, or make the environment unsuitable for it. Traps for rodents are examples of mechanical control. Physical controls include mulches for weed management, steam sterilization of the soil for disease management, or barriers such as screens to keep birds or insects out.

Agriculture and environment has a close relationship. We are dependent on the environment as well as agriculture and its increased production. In agricultural field, we use different pesticides. It has been found in different countries of the world that in addition to beneficial effects, the improved agricultural practices have tremendous influence on environmental pollution and Bangladesh is not exception to this (Sattar, 1994).

Farmers field school (FFS), IPM club, Department of Agricultural Extension and some non- government organizations (NGOs) were given training on environment friendly practices in vegetable cultivation. Most of the projects worked on environment friendly vegetable cultivation were extension-led projects. Many training was given to the farmers but a little study was conducted on attitude of farmers towards environment friendly vegetable cultivation. Considering the above facts, the researcher felt a thrust to conduct a study to fulfil the following objectives:

1. To determine and describe the socio-economic characteristics of the vegetable growers;
2. To determine farmers' attitude towards environment friendly vegetable cultivation;
3. To explore the relationships between farmers' attitude towards environment friendly vegetable cultivation and their selected characteristics; and
4. To find out the constraints faced by farmers in relation to environment friendly vegetable cultivation.

## 2. MATERIALS AND METHODS

### 2.1 Study area

The study was conducted in the Sadar upazila under Moulvibazar district. It is situated in the north-east side of the country. There are 12 unions in Moulvibazar sadar upazila. The locale of the study was Durlovpur, Noldaria and Damia village of Kanakpur union under Sadar upazila of Moulvibazar district. The selection was made on the basis of suggestions made by Upazila Agriculture Officer (UAO), Sub Assistant Agriculture Officer (SAAO), Union Parishad Member and officials of Sadar Upazila.

### 2.2 Population and sample of the study

The researcher himself with the help of local leaders and concerned Sub Assistant Agriculture Officer (SAAO) prepared an updated list of vegetable growers of the selected villages. A total number of 400 vegetable growers were listed, where 112 were from Durlovpur village, 148 from Noldaria village and 140 from Damia village, which constituted the population of the study. The sample size was determined as 100. Out of 400, 25% was taken as sample size. However, the data were collected from the sample rather population. Hundred vegetable growers were selected from the population following simple random sampling technique. A reserve list of 15 vegetable growers was also prepared. Vegetable growers in the reserve list were used only when a respondent in the original list was not available.

### 2.3 Data Collection

A previously structured interview schedule was used as data gathering instrument keeping in view the objectives of the study. It may be recalled that the schedules were pre-tested in actual field situations before using the same for final data collection among 15 respondents of the study area. Necessary corrections, modifications and additions were made in interview schedule on the basis of results of pre-test. The interview schedule was then printed in its final forms. The researcher himself collected data from the sample farmers through the personal interview schedule during February 10, 2018 to March 15, 2018.

## 2.4 Variables of the Study

Farmers' attitude towards environment friendly vegetable cultivation was considered as the dependent variable. The researcher selected eleven socio-economic characteristics of the farmers viz age, education; family size, farm size, training received, time spent in vegetable field, annual family income, annual income from vegetable cultivation, knowledge on environment friendly vegetable cultivation, organizational participation and credit received were independent variables. Therefore the underlying hypothesis is "There is no relationship between each of the selected characteristics of the farmers and their attitude towards environment friendly vegetable cultivation".

## 2.5 Data Analysis

Data collected from the respondents were coded, compiled, tabulated and analysed in accordance with the objectives of the study. Various statistical measures such as range, mean,

percentage, standard deviation were used in categorizing and describing the dependent and the independent variables. For clarity of understanding, tables were used for presentation of data. Pearson's Product Moment Coefficient of Correlation ( $r$ ) was used to explore the relationship between the independent and the dependent variables. Throughout the study 1% and 5% level of probability was used to reject any null hypothesis.

## 3. RESULTS AND DISCUSSIONS

### 3.1 Socio-economic characteristics of the farmers

Result indicates that the middle and young aged respondents constitute about 87% of the respondents. Young and middle aged people are generally receptive to new ideas and things. However, they might have valuable opinion in regard to use of environment friendly vegetable cultivation. Vegetable growers under 'secondary education category' constitute the highest proportion 42% compared to 28% 'illiterate' category, 26% primary and 4% above secondary level category.

**TABLE 1: Selected socio-economic characteristics of the respondents**

Socio-economic factor	Frequency	Percent	Socio-economic factor	Frequency	Percent
Age (years)			Moderate time spent (4-7)	69	69
Young (up to 35)	34	34	Long time spent (above 7)	24	24
Middle age (36-50 years)	53	53	Mean	5.81	
Old (above 50 years)	13	13	Standard Deviation	1.82	
Mean	39.4		Annual family income (thousand taka)		
Standard Deviation	10.30		Low income (up to 150.00)	2	2
Education (year)			Medium income (150.00-250.00)	86	86
Illiterate (0-0.5)	28	28	High income (above 250.00)	12	12
Primary education (1-5)	26	26	Mean	157.08	
Secondary education (6-10)	42	42	Standard Deviation	81.91	
Above secondary education (>10)	4	4	Annual income from vegetable cultivation (thousand taka)		
Mean	4.94		Low vegetable income (up to 18.00)	6	6
Standard Deviation	3.98		Medium vegetable income (19.00- 73.00)	85	85
			High vegetable income (above 73.00)	9	9
Family Size (number)			Mean	45.83	
Small (up to 4)	15	15	Standard Deviation	27.95	
Medium (5-8)	65	65	Knowledge (score)	66	66
Large (above 8)	20	20	Poor knowledge (up to 10)	16	16
Mean	6.77		Medium knowledge (11 -23)	66	66
Standard Deviation	2.09		High knowledge (above 23)	18	18
Farm size (ha)			Mean	17.00	
Marginal (< 0.2)	39	39	Standard Deviation	6.02	

Socio-economic factor	Frequency	Percent	Socio-economic factor	Frequency	Percent
Small (0.2 - <1.0)	56	56	Organizational participation (score)		
Medium (1- 3)	5	5	Low participation (up to 2.00)	17	17
Mean	0.39		Medium participation (3.00-7.00)	64	64
Standard Deviation	0.36		High participation ( above 7.00)	19	19
Training received (days)			Mean	5.19	
No training (0)	19	19	Standard Deviation	2.56	
Low training (1 -5)	68	68	Credit received (thousand taka)		
Medium training (above 5)	13	13	Low credit(up to 3)	14	14
Mean	2.85		Medium credit (4-17)	68	68
Standard Deviation	2.24		High credit (above 17)	18	18
Time spent in vegetable field (hours)			Mean	10.70	
Short time spent (up to 3)	7	7	Standard Deviation	6.89	

Education broadens the horizon of outlook of vegetable growers and expands their capability to analyze any situation related to vegetable cultivation. Medium family size constituted the highest proportion 65% and the lowest 15% in small family size and 20% were large family size. The average family size of the vegetable growers of the study area (6.77) was higher than that of national average of 4.9 (BBS, 2008). Small farm holder constituted the highest proportion 56% and the lowest 5% in medium farm holder and 39% had marginal farm. This was due to inheritance of little land from parents, selling of land for going foreign country; etc. The average farm size of the vegetable growers of the study area (0.39 hectares) was higher than that of national average (0.06 hectares). Majority 68% of the respondents had low training, while 19% of them had no training and only 13% had medium training. Training makes the farmers skilled and helps them to acquire knowledge about the environment friendly vegetable cultivation. The findings of the study reveal that 93% of the farmers spent moderate to long time in their vegetable field. For that reason high income from vegetable cultivation were found. The study reveals that majority 94% of the respondents had medium to high income from vegetable cultivation. Another reason is that moderate or long time spent in the vegetable field ensures intensive care which ultimately increases the maximum production of yield. The annual family income of the farmers of the study area was medium. The reason might be due to the fact that most of the respondents of the study area were not only engaged in vegetable cultivation but also in other sources such as service, business etc. maximum 66% of the respondents had medium knowledge, 16% had poor knowledge and 18% of the respondents had high knowledge on environment friendly vegetable cultivation. Majority 81% of the respondents had low to medium participation in different organization and highest portion (68 percent) of the respondents had received medium

amount of credit, while 14 percent low and 18 percent received high amount of credit in the study area.

### 3.2 Farmers' attitude towards environment friendly vegetable cultivation

The observed scores for attitude towards environment friendly vegetable cultivation ranged from 34 to 83 against the possible range of 20 to 100 with a mean of 54.82 and standard deviation of 15.59.

**TABLE 2: Distribution of the vegetable growers according to their attitude towards environment friendly vegetable cultivation**

Categories	Respondents		Mean	Standard deviation
	Number	Percent		
Highly unfavorable attitude (<40)	20	20	54.82	15.59
Unfavorable attitude (40- <60)	40	40		
Neutral attitude ( 60)	1	1		
Favorable attitude (>60-80)	33	33		
Highly favorable attitude (>80)	6	6		
Total	100	100		

Based on the attitude towards environment friendly vegetable cultivation scores, the respondents were classified into five categories as shown in table. The findings indicate that

majority (40%) of the respondents had unfavorable attitude towards environment friendly vegetable cultivation. The reason may be environment friendly practices require higher level of skills, formal education, frequent contact with extension personnel's, season long training. Most of the farmers in the study are lacking in all most all those motivating factors resulting to the formation of positive attitude towards

environment friendly vegetable cultivation. List of environment friendly vegetable cultivation practices of the respondents given below in the table 3. Based on the result it can be said that, respondents showed more favorable attitude to the cultural control and showed less favorable attitude to the mechanical control. Genetic and biological control were in 2<sup>nd</sup> and 3<sup>rd</sup> position respectively.

**TABLE 3: Practice wise attitude score of the respondents towards environment friendly vegetable cultivation**

Sl. no.	Environment friendly vegetable cultivation practices	Categories	Respondents		Mean	Standard deviation
			Number	Percent		
1.	Mechanical control	Strongly disagree	43	43	2.28	0.78
		Disagree	25	25		
		No opinion	16	16		
		Agree	13	13		
		Strongly agree	3	3		
2.	Biological control	Strongly disagree	19	19	2.64	1.21
		Disagree	31	31		
		No opinion	27	27		
		Agree	13	13		
		Strongly agree	10	10		
3.	Cultural control	Strongly disagree	0	0	3.11	0.95
		Disagree	14	14		
		No opinion	21	21		
		Agree	24	24		
		Strongly agree	41	41		
4.	Genetic control	Strongly disagree	28	28	2.81	1.56
		Disagree	23	23		
		No opinion	14	14		
		Agree	10	10		
		Strongly agree	25	25		

### 3.3 Relationship between selected characteristics of the vegetable growers and their attitude towards environment friendly vegetable cultivation

Pearson's product moment correlation co-efficient was computed in order to find out the extent of relationship between attitude towards environment friendly vegetable cultivation and their selected characteristics. To reject or accept the null hypothesis, 1% and 5% level of probability was used. A statistically significant and non-significant relationship was observed when the computed value or "r" was greater or smaller than the tabulated value, respectively.

Pearson Product Moment Correlation Co-efficient revealed that Education (.655), training received (.234), time spent in

vegetable field (.308), annual family income (.292), annual income from vegetable cultivation (.324), knowledge on environment friendly vegetable cultivation (.504), organizational participation (.542) and credit received (.240) had significant positive relationship with the farmers' attitude towards environment friendly vegetable cultivation. The studies of Haider (2005), Kabir & Rainis (2012), Roy (2014), Prakash (2016), and Sohel Rana et al. (2017) support this findings. Farm size (.193) had positive and non-significant relationship with the farmers' attitude towards environment friendly vegetable cultivation. Adeola (2012) and Rana et al, (2017) revealed similar results. However, Age (-.028) and family size (-.083) had negative and non-significant relationship with the farmers' attitude towards environment friendly vegetable cultivation.

**TABLE 4: Correlation co-efficient showing relationship of each of the selected characteristics of the vegetable growers and their attitude**

Dependent variable	Independent variables	Computed value of co-efficient of correlation 'r'	Tabulated value at 98 df	
			0.05 level	0.01 level
Farmers' attitude towards environment friendly vegetable cultivation	Age	-0.028 <sup>NS</sup>	0.196	0.256
	Education	0.655**		
	Family size	-0.083 <sup>NS</sup>		
	Farm size	0.193 <sup>NS</sup>		
	Training received	0.234*		
	Time spent in vegetable field	0.308**		
	Annual family income	0.292**		
	Annual income from vegetable cultivation	0.324**		
	Knowledge on environment friendly practices (IPM) in vegetable cultivation	0.504**		
	Organizational participation	0.542**		
	Credit received	0.240*		

\*\* : Correlation is significant at the 0.01 level; \* : Correlation is significant at the 0.05 level; <sup>NS</sup> Not significant

### 3.4 Constraints faced by the farmers in relation to environment friendly vegetable cultivation

#### 3.4.1 Categorization of the vegetable growers according to their extent of constraints faced in using environment friendly vegetable cultivation

Constraints faced by the farmers in relation to environment friendly vegetable cultivation were investigated in this piece of research. Nine constraints were selected with the consultation of concerned personnel. The constraints score ranged from 6 to 22 against the possible range of 0 to 27. The average was 12.44 and standard deviation was 3.40 as shown in table 5.

**TABLE 5: Distribution of the vegetable growers according to their extent of constraints faced in using environment friendly vegetable cultivation**

Categories	Respondents		Mean	Standard deviation
	Number	Percent		
Low constraint faced (up to 9)	27	27	12.44	3.40
Medium constraint faced (10-15)	70	70		
High constraint faced (Above 15)	3	3		
Total	100	100		

#### 3.4.2 Ranking of the constraints faced by the farmers in using environment friendly vegetable cultivation

In order to ascertain the extent of severity of constraint faced by the farmers in using environment friendly vegetable cultivation, constraint facing index (CFI) was computed. The CFI of any constraint could range from 0 to 300, where 0

indicated no constraint and 300 indicated high constraint. However, the computed Constraint facing index (CFI) of the 9 constraints ranged from 67 to 195 and has been arranged in rank order according to their constraint indices which appears in table 6. Result indicates that the farmers faced highest constraint in "lack of resistant variety" as indicated by its CFI of 195.

**TABLE 6: Ranking of the constraints faced by the farmers in using environmentfriendly vegetable cultivation**

Sl. No.	Constraints	Frequency of extent of constraint faced (N=100)					
		H	M	L	N	CFI	Rank
1.	Lack of resistant variety	35	34	22	9	195	1
2.	Lack of quality seed	33	28	28	11	183	2
3.	Expensive in using light trap	20	32	20	28	144	5
4.	Time consuming in mechanical control to the pests	29	24	22	25	157	4
5.	Lack of pesticides with short residual effect	38	18	16	28	166	3
6.	Lack of knowledge about the beneficial insects and harmful insects	12	29	25	34	119	6
7.	Unavailability of organic farming practices	9	23	35	33	108	7
8.	Lack of cooperation among the farmers	9	16	45	30	104	8
9.	Criticize to other farmers for use of environment friendly practices	4	9	37	50	67	9

*H = High, M = Medium, L = Low, N = Not at all, CFI = Constraint facing Index*

This is the main constraint faced by the farmers in relation to environment friendly vegetable cultivation. The second and third constraints faced by them are "lack of quality seed" (CFI 183) and "lack of pesticides with short residual effect" (CFI 166) respectively. The fourth constraint was "time consuming in mechanical control to the pests" (CFI 157). Fifth constraint was "expensive in using light trap" (CFI 144). Sixth constraint was "lack of knowledge about the beneficial insects and harmful insects" (CFI 119). Seventh constraint was "unavailability of organic farming practices" (CFI 108). Eighth constraint was "lack of cooperation among the farmers" (CFI 104). In this way, comparatively less constraint (ninth) faced by the farmers is "criticize to other farmers for use of environment friendly practices" (CFI 67) that means it is not a serious constraint for the farmers in using environment friendly vegetable cultivation.

#### 4. CONCLUSIONS AND RECOMMENDATIONS

The findings indicated that Education, training received, time spent in vegetable field, annual family income, annual income from vegetable cultivation, knowledge on environment friendly vegetable cultivation, organizational participation and credit received had significant positive relationship with the farmers' attitude towards environment friendly vegetable cultivation. Farm size had positive and non-significant relationship with the farmers' attitude towards environment friendly vegetable cultivation. Age and family size had negative and non-significant relationship with the farmers' attitude towards environment friendly vegetable cultivation. The study it can be concluded that emphasis should be given to the positively related factors to ensure environment friendly vegetable

cultivation. Lack of resistant variety, quality seeds, pesticides with short residual effect etc. are the major constraints faced by the respondents. Participants showed more favorable attitude to the cultural control and showed less favorable attitude to the mechanical control. Genetic and biological control were in 2<sup>nd</sup> and 3<sup>rd</sup> position respectively. Based on the findings it is to recommend that Department of Agricultural Extension (DAE) along with experts NGO representatives, different social media and extension media should play a crucial role to educate, train and motivate farmers to minimize unfavorable attitude. Again, DAE should emphasize on spending more time in vegetable field while providing advisory services to the farmers. The constraints of the vegetable growers to be solved through information or support services so that farmers can easily use environment friendly practices in vegetable cultivation. Finally government should assure need based financial supports to the right person.

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