



## Farmers Awareness on Environmental Degradation used by Modern Agricultural Technologies in a Selected Area of Meherpur District

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**Abstract:** The main aim of the study was to determine the farmer's awareness on environmental degradation used by modern agricultural technologies by exploring the relationships between ten selected characteristics of the farmers and their awareness. Eighty farmers of the selected village Ashrafpur under of Meherpur district constituted the sample of the study. Data were collected by interviewing the farmers using personal interview schedule during the period from August to September, 2013. Among these eighty respondents 37.5% had low, 51.25% respondents had medium and only 11.25% of the respondent had high knowledge about modern agricultural technologies. While 35% respondents had low, 55% respondents had medium and only 10 % had high knowledge about environmental degradation. Among the respondents 25% had poor, 61.25% respondents had medium and only 13.75% had high awareness about environmental degradation caused by the use of modern agricultural technologies. Out of ten independent variables, six of them, that is academic qualification, organizational participation, communication exposure, innovativeness, knowledge about the use of modern agricultural technologies and knowledge about environmental degradation had positive significant relationships with their awareness on environmental degradation caused by the use of modern agricultural technologies. Three independent variable i.e. family size, farm size, and family income had no significant relationship and only age had negative significant relationship with their awareness on environmental degradation used by modern agricultural technologies.

**Key Words:** Awareness, Environmental degradation, Modern agricultural technology

### Introduction

Environment is a broad term. It is defined as the aggregate of all the external conditions and influences, affecting the life and development of an organism. It includes both biotic and abiotic substances, energy and forces, e.g. temperature, light, air, water, soil and other organisms. Environment is a system or organization which covers the biological world, the non-biological world, manufactured environment and the social environment that affects and supports the growth of life of individual or group of individuals including all kinds of flora and fauna. The major components of environment are - human, flora and fauna, and inanimate objects. Environmental degradation is the deterioration of the environment through depletion of resources such as air, water, and soil; the destruction of ecosystems and the extinction of wildlife. It is defined as any change or disturbance to the environment perceived to be deleterious or undesirable (Johnson *et al.*, 1997).

The environment is of global concern today and is a burning issue for discussion. Because the global environment is changing more rapidly than any time in the known history and it is difficult to force all the changes that will occur in the next 21<sup>th</sup> century. Climatic change, ozone layer loss, deforestation, desertification, air pollution, water pollution and so on are widely accepted as serious problems threatening earth's survival and existence.

Agriculture and environment has a close relationship. The existence of human being depends on proper and pollution free environment. To feed the large number of world's population, the need to boost agricultural production serves as a powerful driving force to promote the intensive use of land, high yielding varieties, agro-chemicals and irrigation which has disastrous impact on the wider environment, agro-ecosystems and human health (Maredia and Pingali, 2001). Agricultural intensification and expansion have destroyed biodiversity and habitats, driven wild species to extinction, accelerated the loss of environmental production services and eroded agricultural genetic resources essential for food security in the future (IUCN, 2000).

Agricultural production has improved dramatically in the last two decades due to the advancement in modern technologies such as use of chemical fertilizer, pesticide and irrigation water (Dorosh, 2000).

Due to improper use of agro-chemicals and irrigation water, most of the farming and fishing communities in many ecological zones of Bangladesh are affected. The unwise use of chemical fertilizer affects the water resource that causes pollution to both the surface and ground water, which greatly impacts human water consumption and finally makes water a scare resource (Yu *et al.*, 2009). Excessive use of pesticides also affects many species of mammals, butterflies, bees, amphibians, plant, and

soil fertility resulting in environmental degradation (Richard, 2010).

Therefore, it is clear that large scale use of fertilizers, pesticides and irrigation for a long period seriously affect on the ecosystem. In this regard, sustainable farming system is a prime consideration to save the environment.

The specific objectives of the study were as follows:

- to identify the modern agricultural technologies being used by the farmers.
- to determine the extent of awareness of the farmers on environmental degradation.
- to explore the relationships between the selected characteristics of the farmers and their awareness on environmental degradation caused by modern agricultural technologies.

### Methodology

An area was selected purposively as the location of the study keeping the point in mind the awareness of the farmer. Purposive sampling of the study area was done because of closeness with researcher's own area. The study area encompasses only one village under Meherpur district. The name of the village is Ashrafpur. In general the sampling frame is the representation of a population by developing a specific list that closely related to all the elements in the population. Every research needs a standard sampling frame. The total number of farmers in Ashrafpur village was 536 which constituted the sampling population. A list of all these farmers was prepared to make it a sample frame. In the second step, 15% of the farmers of the village were selected as sample by using a table of random numbers. Eighty (80) farmers were selected in this way and constituted the sample for this study.

A variable is any characteristic which can assume varying or different values in successive individual cases (Ezekiel and Fox, 1959). An organized piece of research usually contains at least two important elements an independent and a dependent variable. An independent variable is that factor which is manipulated by the researcher in his attempt to ascertain its relationship to an observed phenomenon. A dependent variable is that factor which appears, disappears or varies as the researcher introduces removes or varies the dependent variables (Townsend, 1953). In the scientific research, the selection and measurement of variables constitute a significant task. In this connection, the researcher reviewed literature to widen his understanding about the nature and scope of the variables relevant in this piece of research. 11 variables were selected of which 10 were selected as independent variables and

one was selected as dependent variable. Independent variables are: age, academic qualification, farm size, family size, annual family income, organizational participation, communication exposure, innovativeness, knowledge about modern agricultural technologies and knowledge about environmental degradation.

### Results and Discussion

#### Selected characteristics of the farmers

The selected characteristics of the farmers are described in this section and a summary profile of these characteristics is presented in Table 1. Data indicate that highest proportion (60%) of the respondents fell in the middle category while 11.25% and 28.75% respondents fell in young and old category respectively. In case of academic qualification most of the farmers (52.5%) fell in the primary level category, 23.75% of the farmers had no literacy, and 21.25% of them in the secondary level and only 2.5% of the farmers had higher secondary qualification. Data computed in Table 1 show that most (56.25%) of the farmers had medium family compared to 30% of the farmers had small family and only 13.75% had large family. The findings indicated that 70% of the farmer's were having medium to large family size. 0% of the farmers in the study area were landless, 15% were marginal farmers, 68.75% were small, 13.75% were medium and 2.5% had large farm holding. Similar findings were observed by Bene (2006).

Data presented in Table 1 indicate that 33.75% of the farmers had low income, 52.5% had medium income and only 13.75% of them belonged to high income category. 36.25% of the respondent farmers had no organizational participation, 56.25% had low participation, 6.25% had medium participation and only 1.25% of them had high participation. Data presented in Table 1 also indicate that 47.5% of the respondents had medium communication exposure, 43.75% had low communication exposure and only 8.75% had high communication exposure. 53.75% of the respondents were moderately innovative, while 36.25% of them less innovative and only 10% were highly innovative. Thus in respect of innovativeness the overwhelming majority (90%) of the farmers was small to moderately innovative. Similar findings were obtained by Zaidi *et al.* (2011).

Farmer's knowledge and awareness about the use of modern agricultural Technologies and environmental

degradation. In case of farmers knowledge about modern agricultural technology it was observed that that 37.5% of the respondents had low agricultural knowledge, 51.25% had medium agricultural knowledge and only 11.25% of them had high agricultural knowledge (Table 2). Similar findings were found by Ajayi and Banmeke (2007). It was found that farmers know name of chemical fertilizer and insecticides very well. They had medium knowledge about criteria of good seed, weeds name of rice, deficiency symptom of TSP. But they had low knowledge about favorable environment for insect. They had also low knowledge about suitable time for insecticide and fertilizer application. So it is important to take necessary steps to increase farmers awareness in which they had low knowledge.

It was also indicated that 35% of the respondents had low knowledge, 55% had medium knowledge and only 10% of them had high knowledge about environmental degradation (Table 2). Thus, in respect of about environmental degradation knowledge, the majority (90%) of the farmers having category of low to medium types knowledge. It was found that farmers know causes of water pollution and two criteria of water pollution very well among knowledge about environmental degradation indicate

they had good knowledge about causes of water pollution. They had medium knowledge about the causes of biodiversity loss, and the effect of soil degradation. But they had low knowledge about the criteria of biodiversity. They had also low knowledge about the effect of environmental degradation and green cultivation.

The respondents were classified into three categories based on their obtained awareness scores. The categories and distribution of the farmers are shown in Data presented in Table 2 also indicate that the large proportion (61.25%) of the respondents fell in the medium awareness category; while 25% had poor awareness and only 13.75% of the respondents were having high awareness. This means that majority (86.25%) of the farmers were very low to medium aware about the environmental degradation caused by the various known and unknown factor. Similar findings were observed by Islam *et al.*, (2006).

**Table 1** Salient features of the respondents

Characteristics and measurement	Possible range	Observed range	Category	Farmers		Mean	Std Dev
				frequency	%		
Age (year)		23-60	Young (up to 30)	9	11.25	44.48	9.78
			Middle age (31-50)	48	60		
			Old (above 50)	23	28.75		
Academic qualification (year of schooling)		0-11	Illiterate (0)	19	23.75	3.53	3.38
			Primary level (0,5-5)	42	52.5		
			Secondary level (6-10)	17	21.25		
			Higher secondary(above 10)	2	2.5		
Family size (number)		3-10	Small (2-4)	24	30	5.51	1.8
			Medium (5-7)	45	56.25		
			Large (Above 7 )	11	13.75		
Farm size (Hectre)		0.03-4.42	Landless (0)	0	0	0.60	.62
			Marginal (.021-2)	12	15		
			Small (.21-1)	55	68.75		
			Medium (1.01-3)	11	13.75		
			Large (above 3)	2	2.5		
Annual family income (thousands)		29-250	Low (upto 50)	27	33.75	75.3	44.25
			Medium (51-100)	42	52.5		
			High (above 100)	11	13.75		
Organizational participation (score)	0-21	0-11	No Participation (0)	29	36.25	1.25	1.98
			Low (1-5)	45	56.25		
			Medium (6-10)	5	6.25		
			High (Above10)	1	1.25		
Communication exposure (score)	0-45	4-26	Low (>10)	35	43.75	11.79	5.35
			Medium (10-20)	38	47.5		
			High ( above 20)	7	8.75		
Innovativeness (score)	0-25	5-25	Low (>10)	29	36.25	12.76	5.51
			Medium (10-20)	43	53.75		
			High ( above 20)	8	10		

**Table 2** Farmers knowledge and awareness about the use of modern agricultural Technologies and environmental degradation

Characteristics and measurement	Possible range	Observed range	Category	Farmers		Mean	Std
				frequency	%		
Knowledge about the use of modern agricultural technologies (score)	0-20	7-18.5	Low (>10)	30	37.5	11.13	3.09
			Medium (10-15)	41	51.25		
			High ( above 15)	9	11.25		
Knowledge about the environmental degradation (score)	0-20	7-17	Low (>10)	28	35	11.68	2.68
			Medium (10-15)	44	55		
			High ( above 15)	8	10		
Awareness (score)	0-19	8-19	Poor (>10)	20	25	12.38	2.97
			Medium (10-15)	49	61.25		
			High ( above 15)	11	13.75		

**Relationship between respondent characteristics and awareness on environmental degradation**

Out of ten independent variables, six of them had positive significant relationships and three had negative significant relationship with their awareness on environmental degradation used by modern agricultural technologies (table 3).academic qualification, organizational

participation, innovativeness, knowledge about technology and environmental degradation found positive and 1% level of significant relationship with awareness on environmental degradation. Whereas family size, farm size and annual income found not any significant relation with awareness on environmental degradation. Similar findings were observed by Shrestha (2010), Farhad (2005) and Islam (2009).

**Table 3:** Relationship between respondent characteristics and awareness on environmental degradation

Dependent variable	Independent variables	“r” value with 78 degree of freedom
Awareness on environmental degradation	1. Age	- 0.223*
	2. Academic qualification	0.654**
	3.family size	- 0.102NS
	4.Farm size	0.166NS
	5.Annual family income	0.120NS
	6.Organizational participation	0.478**
	7.Communication exposure	0.555**
	8. Innovativeness	0.683**
	9. Knowledge about the use of modern agricultural technologies	0.532**
	10. Knowledge about environmental degradation	0.614**

\*\* Correlation is significant at the 0.01 level (2-tailed)

Correlation is significant at the 0.05 level (2-tailed)

**Table 4** Constraints in mitigation of environmental degradation

Sl. No.	Subject	Respondents number	Yes		No		Rank order
			frequency	%	frequency	Percent	
	Social problems	80	13	16.25	67	83.75	8
	Religious problems	80	3	3.75	77	96.25	9
	Lack of knowledge	80	47	58.75	33	41.25	5
	Lack of technologies	80	65	81.25	15	18.75	2
	Lack of training	80	71	88.75	9	11.25	1
	Lack of communication	80	41	51.25	39	49.75	7
	Lack of money	80	45	56.25	35	43.75	6
	Lack of guidance	80	44	55	36	45	
	Faulty cropping system	80	48	60	32	40	4
	Wrong selection of technology	80	63	78.75	17	21.25	3
	Lack of willingness	80	5	6.25	75	93.75	10

**Constraints in Mitigation of Environmental Degradation**

It was found that lack of willingness, religious and social problems were major constrains in mitigating

environmental degradation (table 4). But they said their main problem was wrong selection of technology, lack of technologies and lack of training. So it is needed to train them related to environmental awareness.

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			frequency	%	frequency	Percent	
	Social problems	80	13	16.25	67	83.75	8
	Religious problems	80	3	3.75	77	96.25	9
	Lack of knowledge	80	47	58.75	33	41.25	5
	Lack of technologies	80	65	81.25	15	18.75	2
	Lack of training	80	71	88.75	9	11.25	1
	Lack of communication	80	41	51.25	39	49.75	7
	Lack of money	80	45	56.25	35	43.75	6
	Lack of guidance	80	44	55	36	45	
	Faulty cropping system	80	48	60	32	40	4
	Wrong selection of technology	80	63	78.75	17	21.25	3
	Lack of willingness	80	5	6.25	75	93.75	10

**Conclusion**

Farmer’s knowledge on the use of modern agricultural technologies is very important for environmentally safe cultivation as well as for human health. This study indicate that about half (51.25) respondents had medium knowledge on use

of modern agricultural technology. The farmers having more knowledge likely to have more education. Education is power that helps an individual to increase his knowledge through different ways. This can also be concluded that knowledge acquisition makes an individual aware of different subject surrounding him. So, steps

should be taken by the government or extension agency or dealer of modern agricultural technologies to impart knowledge and education to the farmers on the use of modern agricultural technologies so that they can use them properly and keep healthy environment in agriculture. The findings of the study revealed that majority (61.25%) of the respondents had medium awareness on environmental degradation while 25% had poor awareness and only 13.75% had high awareness. This means that 86.25% of the respondents were lacking of proper awareness on environmental degradation by various known and unknown factors. On the basis of this fact, majority of the farmers are still in darkness about the environmental degradation. So awareness on the proper use of agricultural inputs should be offered through necessary steps.

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