

Farmers' Perception of the Effect of IPM towards Sustainable Crop Production

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Abstract

The main objectives of this study were to determine the perception of the farmers of the effect of IPM towards sustainable crop production and to explore the relationship of the selected characteristics of the farmers with their perception. The study was conducted with randomly selected 80 farmers in Kumergatha Union under Muktagachha Upazila of Mymensingh district. A pre-tested interview schedule was used to collect data from the respondents during March to April, 2009. Farmers' perception of the effect of IPM towards sustainable crop production was the dependable variable and it was measured by 20 statements on 5-point rating scale. Ten selected characteristics of the respondents constituted the independent variables of the study. Majority of the respondents had high favorable perception while 23.75 percent and 21.25 percent of them had respectively less and moderately favorable perception of the effect of IPM. Six characteristics of the respondents viz. family size, training received, annual family income, knowledge on IPM and innovativeness showed significant positive relationship with their perception but their education and farm size were negatively correlated with perception. The major constraints faced by the farmers in using IPM were lack of beneficial insects, unavailability of biofertilizers and lack of knowledge about beneficial and harmful insects.

Keywords: Perception, IPM, sustainable crop production.

Introduction

The farmers of Bangladesh are mostly dependent on pesticides in the endeavor to control the pests. Use of pesticides is not only expensive but also leads to a number of consequences such as elimination of natural defenders, pesticide-resistant pests outbreaks, so that crop losses increase (Barbier, 1989; Conway and Barbier, 1990; Rola and Pingali, 1993; and Saha *et al.*, 1997). To avoid such consequences and to increase the crop production at the same time, a viable alternative is needed to pest management. Integrated Pest Management (IPM) is the best alternative strategy for pests control.

IPM is not a new practice in Bangladesh. The Government of Bangladesh has given the

importance to IPM, which has been reflected in the Five Year-Plan (1997-2002). The plan stated that in the fifth plan period, the IPM program would be intensified and expanded in order to safeguard crops from pests and combat environmental degradation due to pesticides use. To maintain ecological balance, sound human and animal health, increase farm output and farmers' income on a sustainable basis IPM is the most important practice. The New Agricultural Extension Policy also emphasizes that IPM will be the main policy for controlling pests and diseases. In view of the importance of IPM in Bangladesh, the Strengthening Plant Protection Services Project (SPPS) phase-1 drafted the national IPM policy and the

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Government has approved it in April, 2002 (MoA, 2002). Two Integrated Pest Management Projects and Strengthening Plant Protection Services (SPPS) projects started in 1996 and 1997 respectively. Both the projects were implemented by the Department of Agricultural Extension (DAE).

Perception is a process by which one person become aware of the world around him. Perception of the same situation may differ from individual to individual due to differences and cognitive domain. It referred to the process with the acquisition and interpretation of information from one's environment (Maddox, 1995). Perception is influenced by a number of factors of individual such as, selectivity, interest, response deposition, past experience, feeling, emotion and expectation (Mohiuddin, 1993).

If the farmers are to be motivated in using IPM for sustainable crop production, they

would require a sound perception regarding environmental agricultural hazard caused due to excessive use of chemical fertilizers and pesticides. Their perception to chemicals needs to be changed and more favorable perception need is to be developed towards the proper use of IPM towards sustainable crop production. Without changing their perception from conventional pest control methods to alternative holistic method like IPM, sustainable agriculture production and pollution free environment are not possible. Keeping these facts in mind, the present study had been undertaken to fulfill the following objectives: to find out farmers' perception of the effect of IPM towards sustainable crop production; to explore the relationship between the selected characteristics of the farmers and their extent of perception of the effect of IPM towards sustainable crop production; and to ascertain the problems faced by the farmers in practicing IPM.

Methodology

The locale of the study was Kumargatha Union under Muktagachha Upazila in Mymensingh district. In this upazila, Farmers' Field School (FFS) under IPM Project had been implemented. Considering the intensity of project activities, two villages namely Chalk Narayanpur and Bottoli were selected through pre-visit. From these two villages 175 and 150 farmers were randomly selected respectively. Twenty five percent of these farmers were considered randomly as sample of the study. Thus, the sample size was 80.

The independent variables of this study were the 10 selected characteristics of the farmers namely age, educational qualification, family size, farm size, annual family income, training received, organizational

participation, media contact, knowledge on IPM and innovativeness. These were measured by employing prevailing standard methods. Farmers' perception of the effect of IPM towards sustainable crop production was the dependent variable of the study. For measuring the perception of the farmers a 5 point rating scale with 20 statements (15 positive and 5 negative) was used. Perception Index (PI) was computed by using the following formula:

$$\text{Perception Index (PI)} = S_A \times 4 + A \times 3 + U \times 2 + D_A \times 1 + S_{DA} \times 0$$

Where,

S_A = Total number of farmers expressing their perception "strongly agree" for one statement

A = Total number of farmers expressing their perception "agree" for one statement

U = Total number of farmers expressing their perception "undecided" for one statement

D_A = Total number of farmers expressing their perception "disagree" for one statement

S_{DA} = Total number of farmers expressing their perception "strongly disagree" for one statement

Thus, perception score of a respondent could vary from 0 to 80.

To find out problems confronted by the farmers in practicing IPM a 4 point rating scale was used to test the intensity of

problems on 12 items. Problem confrontation index was computed as follows:

$$\text{Problem Confrontation Index} = P_h \times 3 + P_m \times 2 + P_l \times 1 + P_n \times 0$$

Where,

P_h = Total number of the farmers expressed 'high' problem

P_m = Total number of the farmers expressed 'medium' problem

P_l = Total number of the farmers expressed 'low' problem

P_n = Total number of the farmers expressed 'not at all' problem

Thus, problem confrontation score of a respondent could range from 0 to 36, '0' indicating no problem and '36' indicating high problem.

Findings and Discussion

Farmers' Perception of the Effect of IPM towards Sustainable Crop Production

Data in Table 1 indicated that the majority (55.00 percent) of the respondents had highly favorable perception while 23.75 percent of them had less favorable perception of the effect of IPM towards sustainable crop

production. Since most of the farmers (55.00 percent) of the study area had secondary education, their observation and experience gave them such type of perception of the topic. The study was found in line with the study of Sayeed (2002) and Islam (2000).

Table 1. Overall categories of the farmers based on their perception

Categories	Farmers		Mean	SD
	Number	Percent		
Less favorable (≤ 52)	19	23.75	64.52	12.76
Medium favorable (53-67)	17	21.25		
Highly favorable (>67)	44	55.00		
Total	80	100		

Probable range: 0-80; Observed range: 38-79

Table 2 indicated that "IPM has no harmful effect on the users" got the 1st rank among

the statements. This is due to IPM is a holistic approach and it discourages use of

harmful chemicals that cause serious health problems. "IPM training is necessary to identify the beneficial and harmful insects" stood second in the rank order. It is because of training is one of the best ways of learning. It enables farmers to come in contact with high level of specialists having diversified experience and problem solving capabilities. "IPM keeps the ecology

balance" stood third in the rank order. It is due to IPM functions without disturbing the nature. "In IPM it is necessary to analyze the field condition and to know the weather condition" obtained the least score and so got the last position in the rank order. It may be due to less direct relationship of IPM with field and weather condition.

Table 2. Statement-wise perception score of the farmers regarding of the effect of IPM

Statements	Obtained score	Rank order
(+) IPM has no harmful effect on the users	298	1
(+) Training is necessary to identify the beneficial and harmful insects	293	2
(+) IPM keeps the ecology balance	29	3
(+) IPM is environmental friendly	282	4
(+) IPM is beneficial for earthworms and other soil organisms	278	5
(+) Bean aphid can be controlled by spreading ash	276	6
(+) Production cost may decrease if IPM is used	271	7
(-) IPM reduces soil quality	270	8
(+) IPM reduces the dependency on insecticides	270	9
(+) Using IPM practices increase crop quality	266	10
(+) Insecticides are more harmful for environment than crops	265	11
(+) Better agricultural production is possible by using IPM	261	12
(+) In IPM practice resistant varieties decrease insect pest infestation	261	13
(-) In IPM pesticides use is the only way to control pests	247	14
(-) In IPM it is needed to use insecticides just after pests attack	244	15
(-) IPM does not reduce excessive use of pesticides	237	16
(-) IPM does not prevent the side effects of insecticides	219	17
(+) In IPM pests can be controlled by cultural operation	215	18
(+) In IPM pests can be controlled by biological control	214	19
(+) In IPM it is necessary to analyze the field and weather condition	204	20

Relationship between the dependent and independent variables

Table 3 indicated that education of the farmers had significant negative relationship with their perception. Hossain (1999) and Sarker (1999) also found similar findings. Education is the process of developing the mind of an individual and it increases his power of observation, understanding, decision-making and adjustment to new situation. At the same time, they become modern and accept modern technologies for

more production. Here, farmers being higher educated farmers would have perceived favorably the issues of IPM but, maybe, due to effect of intervention of other variables educating did no show positive relationship with perception which claims further investigations. The relationship between family size and perception of the effect of IPM towards sustainable crop production was significant. Afique (2006) observed similar relationship in his study. In large, diversified family members have opportunity to discuss about any important issue with one another.

So, farmers having large family members might have more perception of the effect of IPM.

Farm size of the farmers had a significant negative relationship with their perception. Haque (1982) also found similar findings. Farmers of bigger farm size remain busy with their farm and get less scope to visit various places of importance outside their own social system as well as come less in contact with various information media and they also less interact with various personnel in organizations. So, these farmers might have less favorable perception of the effect of IPM. Training received by the farmers had a significant positive relationship with their perception. Kabir (2002) also found similar result. Training increases skill, knowledge and changes attitude. Better perception can be developed in an individual due to his participation in training.

Table 3. Perception of the farmers and their selected characteristics

Characteristics	r values
Age	-0.203
Education	-0.514**
Family size	0.582**
Farm size	-0.224*
Training received	0.226*
Annual family income	0.726**
Organizational participation	0.175
Media contact	0.043
Knowledge on IPM	0.620**
Innovativeness	0.860**

* = Significant at 0.05 level

** = Significant at 0.01 level

Annual family income was significantly correlated with farmer's perception. The study conducted by Chintawar (1997) supported this interpretation. It is logical to assume that farmers having low annual family income might have less access to

modern high cost technologies. Farmers having low family income might find alternative practice. So, low annual family income farmers might perceive less perception of IPM. Farmer's knowledge on IPM had significant positive relationship with their perception. Sayeed (2002) also found same finding. Knowledge about any subject matter increases one's thinking capability. So, farmers with high knowledge on IPM might have better perception of the effect of IPM. Farmer's innovativeness also showed significant positive relationship with their perception. Kabir (2002) found similar finding. Innovative farmers are always interested to know about new agricultural aspect and consider the risks involved in adopting. So, farmers being highly innovative would gain better perception of the effect of IPM because of their curiosity and interest of this type of alternative agricultural practice.

Problems of farmers in practicing IPM

Table 4 indicated that the statement "Lack of beneficial insects" got the highest score and hence was considered as the 1st ranked problem. This is due to excessive use of agro-chemicals in the field which kill both the harmful and beneficial insects. The statement "Unavailability of bio-fertilizer" got the 2nd highest score which may be due to require of high technical knowledge for producing bio-fertilizers and insufficient supply of it. The statement "Lack of knowledge about the beneficial insects and harmful insects" was revealed as the 3rd ranked problem. This may be due to lack of awareness and proper counseling. On the other hand, "High expense in using light trap" was considered as the least problem by the farmers because it is easy to make the trap and is not costly and it does not require high technical knowledge.

Table 4. Ranking of problems according to their obtained scores

Problems	Obtained score	Rank order
Lack of beneficial insects	240	1
Unavailability of bio-fertilizer	239	2
Lack of knowledge on beneficial and harmful insects	238	3
Lack of resistant variety	217	4
Lack of quality seed	215	5
High cost of improved seed	215	6
Lack of co-operation among the farmers	191	7
Unavailability of irrigation in time	160	8
Lack of pesticides with short residual effect	156	9
Mechanical control of pest is time consuming	144	10
Unavailability of hand net in time	102	11
High expense in using light trap	82	12

Conclusion

More than half of the respondents had highly favorable perception and still there were some respondents who possessed unfavorable perception of IPM. Thus, it is indicative that there is scope to take necessary steps to make them aware of the effectiveness of IPM. More than half of the respondents had low annual family income. Thus, there is ample scope for increasing income through different sustainable agricultural practices. Organizational participation of the respondents was positively related to their perception of the effect of IPM. Being participant of various organizations, farmers get ample scope to be

well acquainted to various aspects of technologies. Consequently it may lead them to be innovative in farming. And such innovative nature might help them to form favorable perception towards IPM and its implementation. Majority of the farmers faced moderate to high problems in practicing IPM. From this issue, it may be concluded that their barriers might limit them from taking benefits of IPM. To overcome all the limitations technical supports, training based programs, proper policies, government collaborative efforts with other organizations should be implemented.

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