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Constraints faced by the farmers in IPM practices in rice cultivation

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ABSTRACT

The main focus of the study was to determine constraints faced by the farmers in IPM practices in rice cultivation, and to explore the relationship between the constraints faced by the farmers in IPM practices and their selected characteristics. The study was conducted at Ratanpur and Sreeampur union of Nabinagar upazila under Brahamanbaria district. Data were collected from 107 rice farmers who were randomly selected as the sample of the study from an update list of 1534 rice farmers that was prepared with the help of Sub-Assistant Agriculture Officers (SAAOs) of the study area. The researcher collected data through personal contact with a well structural pretested interview schedule. The study revealed that the highest proportion (75.70 percent) of the respondents faced medium constraints in IPM practices, while the17.76 percent of the respondents confronted high constraints and the rest 6.54 percent of respondents faced low constraints in IPM Practices. Pearson's product moment correlation Co-efficient (r) was computed to explore the relationship between the constraints faced by the farmers in IPM practices and their ten selected characteristics. The correlation analysis stated that education, training received in IMP practices,

extension media contract of the farmers had negative relationships with their constraints faced in IPM practices whereas age, total family members, rice cultivation area, annual family income and agricultural experience had no significant relationships with the constraints faced in IPM practices in rice cultivation.

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I. Introduction

Agriculture is the backbone of Bangladesh economy, which contributes 19.29 percent to the country's Gross domestic Product (GDP). About 60 percent of the country's total population is directly or indirectly dependent on agriculture for their livelihoods. More than 48.1 percent of the national labor force is employed in agriculture sector (BBS, 2012). Rice is one of the most important staple foods for more than half of the world's population (IRRI, 2006) and influences the livelihoods and economies of several billion people. In 2010, approximately 154 million ha were harvested worldwide, of which 137 million ha (88 per cent of the global rice harvested) were in Asia – of which 48 million ha (31 percent of the global rice harvested) were harvested in Southeast Asia alone (FAOSTAT, 2012). However; farmers in Bangladesh face many constraints in their farming. Among them, 'pest' is a very common problem which causes severe yield damage every year. Biologically, 'pest' is the organisms such as insects, pathogens, weeds, nematodes, mites, rodents and birds that cause damage or annoyance to man, animals, crops or possessions. National IPM programme began an innovative training programme that entailed a season long experiential learning by farmers to understand the ecology of the rice fields and other crops which helps to empower field school participants and make them confident pest experts, self-teaching experimenters, and effective trainers of other farmers (Quizon et al., 2000). According to an estimate annual yield loss due to insect pest alone is 16 percent for rice, 11 percent for wheat, 16 percent for sugarcane, so percent for vegetable, 12 percent for jute and 18 percent for pulse crops (MOA, 2011). To tackle with this problem, Integrated Pest Management (IPM) is on effective and environment-friendly pest management system. It is an ecological approach to manage pest in which all available effective techniques are deployed in a united program so that the pest population can be managed to avoid economic damage and minimize adverse side effects. A set of decision making toots are utilized to implement IPM at the farmers' level. Now farmers are using various chemical fertilizers and pesticides extensively in their rice fields. Rapid applications of these chemicals are severely hazardous for soil fertility and the environment as well as for the human health. Moreover, it is one of the main causes for increasing the cost of production of rice. As a consequence, many farmers are losing their interests in rice production. They are migrating to other crops give high returns. So IPM practices in rice cultivation are a crucial need for farmers. In addition, it also helps to increase soil fertility, reduces the cost of production and at the same time is environmental friendly. As practicing IPM in rice fields is time demanding and very in need, reducing the constraints faced by the farmers regarding this aspect should get top priority. The foregoing discussion enable some to believe that incorporation of constraints faced by the farmers in IPM practices in rice cultivation in development effort may help to reach rice and other crop protection ability. Therefore, the objectives of this study are to determine and describe some selected characteristics of the rice farmers, to determine the extent of constraints faced by the farmers in IPM practices in rice cultivation, to explore the relationship between the constraints

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faced by the farmers in IPM practices in rice cultivation and their selected characteristics, and to compare the severity of the constraints faced by the farmers in IPM practices.

II. Materials and Methods

This study was conducted on January to March, 2013. Nabinagar upazilla was selected as the location of study. One thousand five hundred and thirty four rice farmers of this upazilla constituted the population of study. Out of these 1534 rice farmers a sample of 107 farmers were selected for the study by following random sampling method. A structured interview schedule was used for collection of relevant data in face-to-face situation. Constraints faced by the farmers in IPM practices in rice cultivation were the main focus of this study and it was considered as the dependent variable. Age, education, total family members, rice cultivation area, training received in IPM practices, annual family income, extension media contact, agricultural experience, cosmopoliteness and knowledge on IPM were considered as independent variables. Age of a respondent was measured by counting the period of time from his/her birth to the time of interview. Education of a respondent was measured in terms of class passed by him/her in formal education system. Total family member of a respondent was measured in terms of the total numbers of members include in the family of the respondents. Rice cultivation area was measured by the area used for rice cultivation in terms of hectares. Training received in IPM practices was measured by the total number of days a respondent received training in his/her entire life on IPM practices. Annual family income of a respondent was measured on the basis of total yearly earning of the respondent and the member of his/her family. Extension media contact was measured on the basis of nature of contact with 10 selected information sources by taking four individual, three group and three mass contact media. Agricultural experience was measured in the no. of years the respondent involved in agricultural farm practices. Cosmopoliteness of the respondents was measured by the nature of visit made by the respondent to ten selected places. Knowledge on IPM was measured by asking 18 questions selected from the different aspect of IPM practices. Two (2) score was assigned for correct answer of each question. Partial score was given for partially correct answer. For measuring constraints faced in IPM practices in rice cultivation by the farmers 12 constraints were selected through consultation with the experts, researchers and from other available (7) sources. Respondents' responses were categorized as high, medium, low, very low and no constraints at all and scores was assigned as 4, 3, 2, 1 and 0 respectively. Finally constraints faced by the farmers in IPM practices in rice cultivation score was calculated by adding up all the scores of all the responses of that respondent. For having a clear understanding of the comparative constraint faced by the farmers, Constraints Faced Index (CFI) for each item was computed by using the following formula:

$$CFI = (C_n \times 4) + (C_m \times 3) + (C_e \times 2) + (C_v \times 1) + (C_n \times 0)$$

where, P_h = Percentage of respondents confronted high constraint in IPM practices

C_m = Percentage of respondents confronted medium constraint in IPM Practices

C_l = Percentage of respondents confronted low constraint in IPM practices

C_v = Percentage of respondents confronted very low constraint in IPM practices

C_n = Percentage of respondents confronted no constraint in IPM practices

Data from all the interview schedules were coded, complied, tabulated and analyzed in accordance with the objectives of the study. The analysis was performed using SPSS (Statistical Package for Social science) computer package and null hypotheses was formulated to test the relationship of independent variables with dependent variable as " there is no relationship between the constraints faced by the farmers in IPM practices in rice cultivation and each of the independent variables of the study". Descriptive analysis such as range, numbers and percentage distribution, mean, standard deviation and rank order were used whenever necessary. Pearson's product moment co-efficient of correlation (r) was used in order to explore the relationship between the concerned variables.

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III. Results and Discussion

Salient features of the constraints faced by the farmers in rice cultivation in IPM practices are presented in Table 01. Observed scores of constraints faced in IPM practices score of 0–48. The average score was 25.03 with a standard deviation 6.43. On the basis of constraints faced in IPM practices the respondent group was classified into three categories (Table 01). Data presented in Table 01 indicated that all the rice farmers were facing varying degrees of constraints. The highest proportion (75.70%) of the rice farmer had medium constraints faced as compared to (17.76%) having high constraints faced and (6.54%) low constraints faced in IPM practices in rice cultivation. This means that the majority (93.46%) of rice farmers had medium to high constraints faced in IPM practices. Imperative constraints faced in IPM Practices the computed constraints faced Index (CFI) of the 12 constraints range from 32 to 374.3 against the possible range 0 – 400 which are arranged in rank order according to their CFI as show in Table 02. Data presented in Table 02 indicated that 'lack of technical knowledge in IPM practices' ranked first followed by 'lack of technical support in IPM practice' and 'unavailability of inputs of IPM practices' while 'lack of knowledge about beneficiaries and harmful insects and pests' and 'doubt about the effectiveness of IPM practices' were ranked last. The summary of the result of the correlation analysis has been presented in Table 03 showing the relationship between selected characteristics of the rice farmers and their constraints faced in IPM practices. Table 03 revealed that education, training received in IPM practices, extension media contact, cosmopoliteness and knowledge on IPM had significant negative relationship with their constraints faced in IPM practices. This is quite logical that higher education, more training received in IPM practices, higher extension media contact and cosmopolitans, and knowledge on IPM can decrease the constraints face in IPM practices in rice cultivation. Other variables like age, total family member, rice cultivation area, annual family income and agricultural experience were found to be non-significant relationship with the constraints faced in IPM practices in rice cultivation. From the above finding, it may be concluded that higher education, more extension media contact, cosmopoliteness and knowledge on IPM can reform to overcome the constraints with of the rice farmers in IPM practices. Training received in IPM practices can increase the level of knowledge on IPM practice and knowledgeable rice farmers have the ability to minimize their constraints in IPM practices. Therefore, it may be recommended that steps should be taken by the concern authority so that the rice farmers can increase their education level, extension media contact, cosmopoliteness and knowledge on IPM. More training on IPM practices should be arranged by the Department of Agricultural Extension (DAE) and other development agencies so that the rice farmers could increase their knowledge on IPM and ultimately minimize their constraints in IPM practices in rice cultivation.

Table 01. Salient features of the constraints faced by the farmers in IPM practices in rice cultivation

Categories (scores)	Respondents		Mean	Standard deviation
	Number	Percent		
Low constraint (<16)	7	6.54	25.03	6.43
Medium constraint (17-32)	81	75.70		
High constraint (>32)	19	17.76		
Total	107	100		

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Table 02. Rank order of 12 selected items of constraints faced by the rice frame in IPM practices

Constrains	Percentage (%) of the respondents					Constraints faced Index (CFI)	Rank order (RO)
	Faced high Constraints	Faced medium Constraint	Faced low Constraint	Faced overflow Constraint	Faced no Constraints		
Lock of technical knowledge in IPM practices	78.7	16.9	4.4	0	0	374.3	1
Lock of technical support in IPM practices	71.2	14.9	7.2	6.7	0	350.6	2
Unavailability of Inputs of IPM practices.	49.7	31.9	10.7	6.3	1.4	322.2	3
High cost of inputs of IMP practices	43.4	24.5	21.6	8.2	2.3	298.5	4
Lack of eagerness to use of IPM practices.	18.3	31.8	26.2	13.7	10	234.7	5
Surrounding farmers are not interested towards IPM practices	4.4	30.4	37.9	11.2	16.1	195.8	6
Lack of demonstration plot	2.4	26.3	34.2	21.5	15.6	178.4	7
Require more labor that chemical pesticide treatments	1.8	19.5	37.9	24.3	16.5	165.8	8
Lack of knowledge and awareness about soil fertility and environmental pollution.	0.7	8.7	41.2	28.7	20.7	140	9
Availability of chemical pesticide in local market.	0.3	4.2	43.1	31.8	20.6	131.8	10
Lack of knowledge about beneficiaries and harmful insects and pests.	0	1.4	36.4	39.4	22.8	116.4	11
Doubt about the effectiveness of IPM practices	0	0	16.7	58.6	34.7	92	12

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Table 03. Co-efficient of correlation showing the relationship between the selected characteristics of the rice farmer and their constraints faced in IPM practices (N = 107)

Dependent variable	Independent variables	Computed value of "r"	Tabulated value of "r"	
			at 5% level	at 1% level
Constraints faced by the farmers in IPM practices	Age	-0.036^{ns}	0.192	0.250
	Education	-0.256**		
	Total family members	0.112^{ns}		
	Rice cultivation area	0.023^{ns}		
	Training received in IPM practices	-0.251**		
	Annual family income	-0.140^{ns}		
	Extension media contact	-0.285**		
	Agricultural experience	-0.131^{ns}		
	Cosmopoliteness	-0.262**		
	Knowledge on IPM	-0.333**		

NS = Not signification
** Significant at 0.01 level of probability at 105 d.f.
* Significant at 0.05 level of probability at105 d.f.

IV. Conclusion

As practicing IPM in rice fields is time demanding and very in need in the country, reducing the constraints faced by the farmers regarding this aspect should be given top most priority. The study revealed that the farmers of the study area faced varying degrees of constraints. From the rank order of the constraints it was concluded that the highest severe constraint was lack of technical knowledge in IPM practices followed by lack of technical support in IPM practices and unavailability of inputs of IPM practice.

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