Bangladesh Journal of Extension Education *ISSN 1011-3916*
Volume 23, No. 1&2, 2011:139-147 *Research Article*

Problem Confrontation by Poor Farmers in Using Manure towards Integrated Plant Nutrition System

M.S. Hossain[1] and M.A.M. Miah[2]

Abstract

The purpose of this study was to investigate the resource poor farmer's problem confrontation in using manures towards Integrated Plant Nutrition System (from here after IPNS) and also to explore the relationship between the selected characteristics of the resource poor farmers and their problem confrontation. The study was conducted in 17 Unions of Mithapukur Upazila under Rangpur district. All the resource poor farmers who were involved in Integrated Soil Fertility and Fertilizer Management Project (from here after SFFP) 1997–20000 activities were the respondents of the study. Coefficient of correlation (r) was computed in order to explore the relationship between the dependent and independent variables. The resource poor farmer's problem confrontation in using manures towards IPNS was a dependent variable. The major findings showed that 51 percent of the resource poor farmers had high problem confrontation while 38 and 11 percent had medium and low problem confrontation in using manures towards IPNS. Result of correlation showed that education, innovativeness, extension contact, cosmopoliteness and knowledge on manure of the resource poor farmers were found to have significant negative relationship with their problem confrontation.

Keywords: *Response, poor farmers' problem, confrontation, IPNS*

Introduction

The vast majority of people of Bangladesh live below poverty line and maximum farmers are small and marginal types that mean resource poor farmers. The maximum farms size of about 1.5 acre (0.60 hectare). They have a tendency to use huge amount of chemical fertilizers indiscriminately for better production. On the other hand, they also use cow dung, crop residues as fuel. So, the balance in fertility of soil is decreasing day by day. To improve the soil fertility status it is very much essential to use manures such as FYM (Farm Yard manure), compost, green manures (e.g. dhaincha, soybean etc.) in their land along with fertilizer. Because manure increases the organic matter content in the soil. The organic matter in the soils carries out many important functions to improve soil conditions for plant growth. It acts as a source of plant nutrients, which are released slowly through the process of mineralization by soil microorganisms. It is also important that sustainable crop production can be achieved by using only organic manures and also essential to use chemical fertilizers in a balanced way. In this point of view, IPNS (Integrated Plant Nutrition System) concept is important. Thus the approach of IPNS a combination of organic manure and chemical fertilizer bears great significance in the context of sustainable crop production. Integrated Plant Nutrition System is an important component of sustainable agricultural intensification, as well as crop, pest, soil

[1]Former MS student and [2]Professor, Dept. of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

and water management. IPNS is a modern system of nutrient management providing ideal nutrition for a crop. In Bangladesh, SFFP (Integrated Soil Fertility and Fertilizer Management Project) activities are continuing in different areas. The main aim of SFFP activities is to promote the concept of IPNS. The above facts indicate that there is a need for an investigation aiming at an understanding on the problems faced by the resource poor farmers in using manures towards IPNS. An alarming fall in the proportion of organic matter in most of the cultivated soils has been noticed. From different viewpoints, it is clear that manure has a vital role to increase the soil fertility and increases the cation exchange capacities of soil. Since the resource poor farmers are using raw materials in different ways other than using as manure, it is essential to know their problem in using manures towards IPNS. This is necessary in order to develop an extension strategy by which the resource poor farmers become motivated towards sustainable agriculture that would not create problems to environment. Considering the above point of view the present study entitled resource poor farmers problem confrontation in using manures towards IPNS was considered. The organic matter status of Bangladesh soil is around 0.5 -1.5 percent. This picture is very grin for agriculture. One of the better ways to achieve soil fertility, IPNS is also essential matter. The goal of IPNS is to integrate the use of all natural and manmade sources of plant nutrients, so as to increase crop productivity in an efficient and environmentally benign manner, without diminishing the capacity of soil to be productive for present and future generations. But our farmers are not well acquainted with the IPNS due to some hidden factors. So the research was conducted on the basis of following objectives: to determine and describe the extent of problems faced by the resource poor farmers in using manures towards IPNS; and to explore the relationship between problem confrontation of the resource poor farmers in using manures and their selected characteristics.

Methodology

The study was conducted in Mithapukur upazila under Rangpur district. The farmers of Mithapukur upazila who have taken part in different demonstration plots about manures under the SFFP (Integrated Soil Fertility and Fertilizer Project: 1997-2000) activities were the population of the study. Among the farmers only small and marginal farmers i.e. resource poor farmers were selected. An up to date data and complete list of the farmers who were involved in SFFP activities were collected from upazila agriculture office. The list showed that only small and marginal farmers took part in SFFP activities. All these 100 farmers were considered as sample for this study. The independent variables of this study were 10 selected characteristics of the resource poor farmers. There were age, education, family size, farm size, annual income, organizational participation, innovativeness, extension contact, cosmopoliteness and knowledge on manures. The extent of problems faced by the resource poor farmers in using manures towards IPNS was the dependent variable in this study.

Twenty probable problems were selected which related to use manures. All problems were discussed in three aspects: information, management and training issues. For each problem four options were given to the respondents to choose in order to find out the severity of the problem. The

options and their respective weights are as follows:

Options indicating severity of the problem	Weight assigned
High	3
Medium	2
Low	1
Not at all	0

The respondents were asked to choose a single option for each problem. Thus the range of scores of problem confronted by the respondents could vary 0 to 60.

One personal interview schedule was used as data gathering device in keeping with the nature of problems and importantly the characteristics of the respondents. Three types of items namely, closed form, open form and scales were used in constructing the schedule. A pretest was run with the resource poor farmers. Necessary corrections and alterations were made before finally printing the schedule. Data for this study were collected through personal interview. Before starting the collection of data, the researchers had met the respective Upazila Agriculture Officer, other Officers and SAAOs also. The researcher explained the purpose of the study and requested for collecting data.

The raw data collected were examined thoroughly to detect errors and omissions. Data were then coded into coding sheet. In case of qualitative data, putting proper weight against each of the traits to transfer the data into qualitative forms followed suitable scoring techniques. Data collected for the study were compiled, tabulated and analyzed in accordance with the objective of the study. Various statistical measures such as number and percentage distribution, range, average, mean and standard deviation were used in describing the variables of the study. Tables and figures were used in presenting data for clarity of understanding. The relationship between the individual characteristics of the respondents and their problem confrontation were ascertained by using correlation test.

Findings and Discussion

Problem Confrontation of the Resource Poor Farmers in Using Manures

This section will deal with the following two subsections:

I) Problem confrontation of the resource poor farmers in using manures on twenty items

II) Overall problem confrontation of the resource poor farmers in using manures

Problem Confrontation of the Resource Poor Farmers in using Manures on Twenty Items

Problem Confrontation of the Resource Poor Farmers in 20 selected problems in using manures was investigated in this piece of research. It was considered in order to ascertain the extent of severity of problem confronted by resource poor farmers in using manures. Problem confrontation score was calculated by using problem confrontation Index (PCI) and it was computed by using the following formula:

$$\text{Problem Confrontation Index} = Ph \times 3 + Pm \times 2 + Pl \times 1 + Pn \times 0$$

Where,

Ph = Total number of the resource poor farmers expressed ‘high’ problem

Pm = Total number of the resource poor farmers expressed ‘medium’ problem

Pl = Total number of the resource poor farmers expressed ‘low’ problem

Pn = Total number of the resource poor farmers expressed 'not at all' problem

Thus the Problem Confrontation Index of any problem could range from o to 300, where '0' indicating no problem and '300' indicating high problem. However, the computed PCI of the 20 problems ranged from 269 to 69 and have been arranged in rank order according to their problem indicated which appears in Table 1.

Table 1 Details of problem confrontation of the resource poor farmers in using manure

Problems	Resources poor farmers (N=100)				PCI	Rank order
	High (%)	Medium (%)	Low (%)	Not at all (%)		
Management Issues						
1. High cost of manures	82	11	1	6	269	1
2. Lack of manures (e.g. cowdung, compost etc.) in time.	64	28	2	6	250	2
3. Lack of money to prepare manures	61	30	5	4	248	3
4. Lack of credit facilities for preparation manure	59	24	6	11	231	4
5. Lack of land to prepare manure	49	37	6	8	227	5
6. Preparation of FYM like compost is labor consuming.	27	58	11	4	208	6
7. Heavy rainfall in rainy season hampers in preparing manure.	38	43	7	12	207	7
8. Disinterest to set demonstration due to excess economic investment	15	75	5	5	200	8
9. Using cowdung as fuel	10	79	10	1	198	9
10. Crop residues used as fuel	7	81	10	2	193	10
11. Absence of sufficient demonstration plots on FYM and green manures	9	62	13	16	164	14
Information Issues						
12. Lack of knowledge in applying balanced fertilizer towards IPNS	4	81	10	5	184	11
13. Lack of printed materials like leaflets booklets etc. about the preparation of manure.	6	69	15	10	173	12
14. Lack of idea in using manures towards IPNS.	29	28	28	32	154	15
15. Lack of technical knowledge in preparing manures (e.g. compost, FYM etc.)	11	36	31	22	136	17
16. Doubt about the effectiveness of manures	5	8	36	51	69	20
Training Issues						
17. Inability to understand the training materials due to illiteracy	9	59	22	10	167	13
18. Lack of training facility to prepare and use of manures	30	21	21	28	153	16
19. Inability to attend training regularly and timely due to long distance of training place from home	8	44	7	41	119	19
20. Lack of tendency to participate IPNS related training program.	7	16	37	40	90	19

Date contained in Table 1 indicates that resource poor farmers confirmed the problem most is "high cost of manures" as indicate by its PCI of 269. The second and third problems confronted by them were "lack of manures (e.g. cowdung, compost etc.) in time" and "lack of money to prepare manures" respectively. In this way, the problem confronted least by the resource poor farmers is "doubt about the effectiveness of manures".

Overall Problem Confrontation of the Resource Poor Farmers in Using Manures

Problem confrontation score of the resource poor farmers ranged from 10 to 52 against a possible range to 0 to 60 with an average of 23.35 and standard deviation 9.05. According to problem confrontation score, the resource poor farmers were classified into 3 categories as shown in Table 2.

Table 2 Classification of the resource poor farmers according to their overall problem confrontation

Scoring method	Probable range	Observed range	Categories	Farmers		Mean	SD
				No.	%		
Scaling	0-60	10-52	Low problem (up to 22)	11	11	23.35	9.05
			Medium problem (23-37)	38	38		
			High problem (>38)	51	51		

From the Table data reveal that the highest proportion (51 percent) of resource poor farmers had high problem confrontation, while 38 percent had medium problem confrontation in using manures. Low problem confrontation was found only 11 percent. In the study area, problem faced by both the high and medium problem confronted resource poor farmers (89 percent) in using manures were like high cost of manure, lack of printed materials, cowdung/crop residues used as fuel, lack of training facility, absence of demonstration plots, lack of money to prepare manure etc.

Probable Measures to Solve Problems as Perceived by the Resource Poor Farmers

During interview each of the resource poor farmers was asked to mention their opinion for probable measures to solve the problems as perceived by them. The solutions arranged according to their number of citations are presented below in Table 3

"Adequate supply of manure in time" is the top ranked measure (No. of citations = 78) as suggested by resource poor farmers. Manure is an important element to develop the fertility. Before cultivating the any crops adequate quantity of manure is very much essential in time. So, the adequate supply of manure must be ensured in proper time for the resource poor farmers and in this way, this problem may be solved.

'Distribution of agriculture credit with low interest" is the next important measure (No. of citations = 68) as suggested by resource poor farmers. Many NGO give loan in different aspects. But they normally do not give loan to the resource poor farmers to prepare manure. So, agriculture credit should be increased to prepare the manure.

Table 3 Probable solutions of problems related to use manures as perceived by the respondents

Sl. No.	Solutions	Number of citations	Rank order
1	Adequate supply of manure in time	78	1
2	Distribution of agriculture credit with low interest	68	2
3	Providing sufficient extension services	64	3
4	Distribution of green manuring seeds (e.g. dhaincha, soybean etc.) with low price	58	4
5	Providing sufficient training facility	45	5
6	Providing sufficient government facility	35	6
7	Setting demonstration plots	27	7
8	Supply of printed materials (e.g. leaflets, booklets etc.)	20	8

"Providing sufficient extension services" is the next measure (No. of citations = 64) as perceived by the resource poor farmers. About 47 percent of the respondents in the present study were found to have either without education or primary education. With such a background of the respondents it is normal that they cannot take the advantage of written materials such as leaflets, booklets, pamplets etc. by concerned agencies in using manures. They mostly depend on the advice of extension workers. Probably from these understanding the resource poor farmers opined enhancing the field activities by the extension agents so that their problems are to be solved.

Relationship between Independent and Dependent Variables

The computed value of correlation was found to be 0.135 as shown in Table 4 for age and problem confrontation. Following observations were made regarding the relationship between these two variables under consideration: the relationship showed a positive trend and the computed value of r (.135) was found to be smaller than the tabulated value (r=0.197) with 98 degree of freedom at 0.05 level of probability.

Resource poor farmers face innumerable problems irrespective of t their age. Problem faced by the resource poor farmers in using manures hardly differ from one another under different age category. Extension agency should be aware of this fact. Mansur (1989), Kashem (1977), Hossain (1985), Islam (1987) and Rahman (1995) also found the similar findings in their studies.

Table 4 Co-efficient of correlation between selected characteristics and problem confrontation of the resource poor farmers in using manures

Selected Characteristics	Co-efficient of correlation
1. Age	0.135
2. Education	-0.372***
3. Family size	0.106
4. Frame size	-0.141
5. Annual income	-0.157
6. Organizational participation	-0.18
7. Innovativeness	-0.371***
8. Extension contact	-0.273**
9. Cosmopoliteness	-0.345***
10. Knowledge on Manures	-0.203*

*Significant at $p<0.05$;
**significant al $p<0.01$;
***significant at $p<0.001$

The computed value of correlation was found to be -0.372 as shown in Table 4 for Education and problem confrontation. Following observations were made regarding the relationship between these two variables under consideration: the relationship showed a negative trend and the computed value of r (-0.372) was found to be greater than the tabulated value (r=0.325) with 98 degree of freedom at 0.001 level of probability.

Based on the above findings it was concluded that the education of the respondents had significant negative relationship with their problem confrontation. This indicates that the higher the education the lower was the problems in using manures. Education upgrades individuals in all aspects. The studies of Kashem (1977), Islam (1987) and Rahman (1995) also conform to these findings.

The computed value of correlation was found to be 0.106 as shown in Table 4 for Family size and problem confrontation. Following observations were made regarding the relationship between these two variables under consideration: the relationship showed a positive trend and the computed value of r (0.106) was found to be smaller than the tabulated value (r=0.197) with 98 degree of freedom at 0.05 level of probability.

Based on the above findings it is concluded that the family size of the respondents had no significant relationship with their problem confrontation. The computed value of correlation was found to be -0.140 as shown in Table 4for Farm size and problem confrontation. Following observation were made regarding the relationship between these two variables under consideration: the relationship showed a negative trend and the computed value of r (0.141) was found to be smaller than the tabulated value (r=0.197) with 98 degree of freedom at 0.05 level of probability.

Based on the above findings it was concluded that the farm size of the respondents had no significant relationship with their problem confrontation.

The computed value of correlation was found to be -0.157 as shown in Table 4 for Annual income and problem confrontation. Following observations were made regarding the relationship between these two variables under consideration: the relationship showed a negative trend and the computed value of r (-0.157) was found to be smaller than the tabulated value (r=0.197) with 98 degree of freedom at 0.05 level of probability.

From the above findings it was concluded that the annual income of the respondents had no significant relationship with their problem confrontation. As the computed value showed a negative trend, it may be expected that the higher the income, lower was their problem confrontation in using manures. Islam (1987) and Rahman (1995) also found the similar findings. The computed value of correlation was found to be -0.018 as shown in Table 4 for Organizational participation and problem confrontation. Following observations were made regarding the relationship between these two variables under consideration: the relationship showed a negative trend and the computed value of r (-0.018) was found to be smaller than the tabulated value (r=0.197) with 98 degree of freedom at 0.05 level of probability.

Based on the above findings, it was concluded that the organizational participation of the respondents had no significant relationship with their problem confrontation. Similar findings were also observed by Ali (1978), Saha (1983), Sarker (1983) and Mansur (1989).

The computed value of correlation was found to be-0.137 as shown in Tables 4for innovativeness and problem confrontation. Following observations were made regarding the relationship between these two variables under consideration: the relationship showed a negative trend and the computed value of r (-0.371) was found to be smaller than the tabulated value (r=0.325) with 98 degree of freedom at 0.001 level of probability.

Based on the above findings, it was concluded that the innovativeness of the respondents had negative significant relationship with their problem confrontation. Higher innovativeness in an individual inspires him to adopt new technology and help them to overcome problems.

The computed value of correlation was found to be -0.273 as shown in Table 4 Extension contact and problem confrontation. Following observations were made regarding the relationship between these two variables under consideration: the relationship showed a negative trend and the computed value of r (-0.273) was found to be greater than the tabulated value (r=0.257) with 98 degree of freedom at 0.01 level of probability.

Based on the above findings, it was concluded that the extension contact of the respondents had negative significant relationship with their problem confrontation. It indicates that the higher the extension contact of the respondents the lower was the problems in using manures.

The computed value of correlation was found to be -0.345 as shown in Table 4 for Cosmopoliteness and problem confrontation. Following observations were made regarding the relationship between these two variables under consideration: the relationship showed a negative trend and the computed value of r (-0.345) was found to be greater than the tabulated value (r=0.325) with 98 degree of freedom at 0.001 level of probability.

Based on the above findings, it was concluded that the cosmopoliteness of the respondents had negative significant relationship with their problem confrontation. The computed value of correlation was found to be -0.203 as shown in Table 4 for Knowledge on manures and problem confrontation. Following observations were made regarding the relationship between these two variables under consideration: the relationship showed a negative trend and the computed value of r (-0.203) was found to be greater than the tabulated value (r=0.197) with 98 degree of freedom at 0.05 level of probability.

Based on the above findings, it was concluded that the knowledge on manures of the respondents had negative significant relationship with their problem confrontation.

Conclusion

Conclusions drawn on the basis of the findings of this study and their interpretation in the light of the other relevant factors are furnished below. It was found that the resource poor farmers experienced various problems in using manures. Majority of the resource poor farmers (89 percent) under study had medium and high problem confrontation. These farmers may experience a lot of problem until of unless necessary steps are taken regarding this aspect. Adequate supply of manure in time, distribution of agriculture credit, providing sufficient extension service and distribution of green manuring seeds with low price appeared as

the important measures to solve the existing problems in using manures as suggested by the resource poor farmers themselves. Considering these suggestions, the investigator concluded that the resource poor farmers would not be able to use manure properly if the above measures are not taken care of either by themselves of through external forces.

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