

Environmental impact of using grameen shakti organic manure on boro rice cultivation

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Abstract: A study was conducted during January to June, 2007 to determine the extent of environmental impact of using grameen shakti organic manure (GSOM) on boro rice cultivation and to explore the relationships between 10 selected characteristics of the farmers with the extent of environmental impact of using grameen shakti organic manure on boro rice cultivation as perceived by them. Data was collected by interviewing from 90 farmers of 6 villages of 3 unions of Savar upazila under Dhaka district. Ten selected characteristics of farmers were the independent variables of this study, while environmental impact of using grameen shakti organic manure on boro rice cultivation being focus of the study constituted the only dependent variable. In order to explore the relationships between selected characteristics of the farmers with their impact of using grameen shakti organic manure on boro rice cultivation, the Pearson Product Moment Correlation and to determine the interrelationships among the variables, correlation matrix was computed. Findings revealed that age, education, farm size, farming experience, boro cultivation area, use of grameen shakti organic manure on boro rice cultivation, knowledge on boro rice cultivation and attitude towards use of grameen shakti organic manure on boro rice cultivation of the respondents had significant positive relationship, problems faced in using grameen shakti organic manure on boro rice cultivation by the respondents had significant negative relationship and annual family income of the respondents had no significant relationship with environmental impact of using grameen shakti organic manure on boro rice cultivation.

Key words: Grameen shakti organic manure, environmental impact, boro rice.

Introduction

Now a days, farmers are using excessive chemical fertilizers for their crop production which ultimately create hazardous situation to soil, water and air and ultimately creates imbalanced condition of environment. The anti-natural agricultural practices degrade the soil and ecological balance in many ways resulting poor output (Murakami, 1991). By using chemical fertilizer in the crop field the immediate production may be raised, but its long term effect is harmful. As a result our soil health is decreasing. Use of organic manure has no harmful effect to the soil, plant as well as human. It influences the physical, chemical and biological properties of soils. But in Bangladesh, most of the soils contained less than 1.5% and some soils even less than 1% organic matter (BARC, 2005). On the other hand farm families in the rural areas used straw, cowdung as fuel due to crisis of fuel. So crop residues, cowdung etc can not mix-up in recycling process of soil. As a result, soils are depriving from the natural organic sources. In this concept Grameen Shakti, a private agricultural extension organization have taken an initiatives by producing an organic fertilizer named "Grameen Shakti Organic Manure(GSOM)" from rural organic matter with Biomass plant slurry and they claimed that it is environment friendly and free from any toxicity and it can increase crop productivity by increasing soil fertility. In Bangladesh rice alone constitutes 95% of the food grains production (Julfiquar *et al.*, 1988). It is the synonym for food in Bangladesh and has been traditional source of carbohydrates since the prehistoric day's (Alam, 1997). About 80% of the total cultivable land is used for rice's and its total production is 25.18 million metric ton where boro shares about 48.52% of total rice production (BBS, 2003). As GSOM is an innovation of organic farming and no research work so far been conducted, the researchers felt to conduct the present research to find out its' environmental impact on boro rice cultivation.

Materials and Methods

The study was conducted during April to June, 2007 to determine the extent of environmental impact of using GSOM on boro rice cultivation and to explore the

relationships between 10 selected characteristics of the farmers with the extent of environmental impact of using GSOM on boro rice cultivation as perceived by them. Grameen shakti organic manure was supplied to 180 farmers and data was collected randomly by interviewing from 90 farmers of 6 villages of 3 unions of Savar upazila under Dhaka district. The villages were Rajashan and Dharanda under Savar Sadar union, Sindhuria and Garua under Patharia union and Musurikhola and Chaira under Bhakhurta union. Ten selected characteristics of farmers such as age, education, farm size, farming experience, annual family income, boro cultivation area, use of grameen shakti organic manure on boro rice cultivation, knowledge on boro rice cultivation, attitude towards use of grameen shakti organic manure on boro rice cultivation and problems faced in using grameen shakti organic manure on boro rice cultivation were the independent variables of this study, while environmental impact of using grameen shakti organic manure on boro rice cultivation being focus of the study constituted the only dependent variable. In order to explore the relationships between selected characteristics of the farmers with their impact of using grameen shakti organic manure on boro rice cultivation, the Pearson Product Moment Correlation and to determine the interrelationships among the variables, correlation matrix was computed. Delimitations of the study were that the study confined mainly in boro rice cultivation, 10 selected characteristics of farmers and only the farmers of 6 villages of 3 unions of Savar upazila under Dhaka district.

Results and Discussion

Selected characteristics of the respondent farmers: The impact of using GSOM on boro rice cultivation perceived by the farmers would be influenced by various characteristics of the farmers. Among 10 selective characteristics, the data presented in Table 1 indicated that most (63.33%) of the farmers were middle aged compared to 7.78% and 28.89% being in the young and old aged categories respectively. Breaking up the joint family into single family might be the reasons for most of the farmers falling in the middle aged category than old. It is fact that

for the implementation of successful agricultural practices the farmers need to have knowledge and skill regarding the method of cultivation. Some education is necessary for proper understanding of the information and skills involved in agricultural farming. In this study most (62.23%) of the farmers were marginal or small farmers. But reality is that medium or large farmers can perform their farm activity properly on their medium or large farm. Findings revealed that about three-fourth (74.44%) of the farmers had medium to high farming experience which may be considered as a decision making tools for farm activities. According to their annual family income majority 77.78% of the farmers had either low or medium income family which may support them to purchase necessary inputs as well as perform their agricultural activities properly. It is expected from the data that very

high portion (95.55%) of the farmers cultivated boro rice in their small and medium area of land which can proportionately decrease the problems as well as cost of production with showing the agricultural activities properly. It is quite logical that higher use of GSOM on rice cultivation increases the quality of soil as a result increases sustainability in rice production and only knowledgeable farmers can perform their farm activities properly. In this study most (77.78%) of the respondent farmers had low to medium knowledge and 71.11% used low to medium quantity of GSOM on boro cultivation. Though 88.89% of the respondents had medium to high favorable attitude towards use of GSOM and 90% of the farmers perceived moderate to large impact in using GSOM but 77.78% had faced low to moderate problem in using GSOM on boro cultivation.

Table 1. Selected characteristics of the respondent farmers

Selected characteristics of farmers	Categories of farmers and scoring range	Farmers	
		Number of farmers	percentage of farmers
Age	Young (up to 30 years)	7	7.78
	Middle (above 30 to 50 years)	57	66.33
	Old (above 50 years)	26	28.89
Education	Illiterate (can't read and write)	10	11.11
	Can read and write only (ability to read or write only)	16	17.78
	Primary education (Schooling up to class V)	43	47.78
	Secondary education (Schooling from class VI to SSC)	12	13.33
	Higher secondary education (HSC pass)	5	5.56
Farm size	Bachelor or above (Bachelor or above degree pass)	4	4.44
	Marginal (up to 0.2 hectare)	4	4.44
	Small (> 0.2 hectare to 1.0 hectare))	52	57.79
	Medium (> 1.0 hectare to 3.0 hectare)	31	34.44
Farming experience	Large (> 3.00 hectare)	3	3.33
	Less experience (up to 14.12 years, mean up to -1sd)	23	25.56
	Medium experience (above 14.12 to 32.56 yrs, mean \pm 1sd)	46	51.11
Annual family income	Highly experience (above 32.56 years, above mean \pm 1sd)	21	23.33
	Low income (up to 60000 taka)	26	28.89
	Average income (> 60000 to 120000 taka)	44	48.89
Boro cultivation area	High income(> 120000 taka)	20	22.22
	Small area (<0.537 hectare, mean -1sd)	21	23.33
	Medium area (0.637 to 0.99 hectare, mean \pm 1sd)	65	72.22
Use of GSOM on boro rice cultivation	Large area (>0.99 hectare, mean \pm 1sd)	4	4.45
	Low use (< 697.55 kg, mean -1sd)	12	13.33
	Medium use (697.55 to 1254.43 kg, mean \pm 1sd)	52	57.78
Knowledge on boro rice cultivation	High use (>1254.45kg, mean +1sd)	26	28.89
	Low knowledge (0-13)	15	16.67
	Medium knowledge (14-26)	55	61.11
Attitude towards the use of GSOM on boro rice	High knowledge (27-40)	20	22.22
	Unfavorable attitude (0-24)	10	11.11
	Medium favorable attitude (25-36)	60	66.67
Problem faced in using GSOM on boro rice	High favorable attitude (37-48)	20	22.22
	Little problem (0-12)	28	31.11
	Little problem (13-24)	42	46.67
	Little problem (25-36)	20	22.22

* GSOM = Grameen Shakti Organic Manure

Impact of using GSOM in boro rice cultivation as perceived by the farmers: Data presented in Table 2 indicated that most (71.11%) of the farmers perceived

moderate positive impact in using GSOM on boro rice cultivation compared to 10.00% and 18.89% perceived little and large positive impact respectively. Findings

indicated that 90% of the farmers perceived moderate to large positive impact in using GSOM on boro rice cultivation. It is quite logical that using GSOM can the soil

health and environmental condition as well as production of boro rice.

Table 2. Distribution of the farmers according to impact in using GSOM in boro rice cultivation as perceived by the farmers (N=90)

Range		Categories	Farmers		Mean	Standard deviation
Possible	Observed		Number	%		
0 - 42	14 - 22	Little positive impact	9	10.00	19.15	2.16
		Moderate positive impact	64	71.11		
		Large positive impact	17	18.89		
		Total	60	100		

Relationship between characteristics of farmers and environmental impact of GSOM: Data presented in Table 3 indicated that age, education, farm size, farming experiences, boro rice cultivation area, use of GSOM on boro rice cultivation, knowledge on boro rice cultivation and attitude towards the use of GSOM on boro rice had significant positive relationship with environmental impact of using GSOM in boro rice cultivation. But problem

faced in using GSOM on boro rice cultivation by the respondents had significant negative relationship with environmental impact of using GSOM in boro rice cultivation. Annual family income of the respondents had no significant negative relationship with environmental impact of using GSOM in boro rice cultivation. The above results are almost confronted with the findings of Joarder (2006).

Table 3. Relationship between characteristics of farmers and impact of using GSOM in boro rice cultivation

Dependent variable	Selected characteristics of farmers	Computed value of 'r'	Tabulated value of 'r' (df = 88)	
			5% level	1% level
Impact of using GSOM in boro rice cultivation as perceived by the boro rice cultivators	Age	0.238*	0.208	0.270
	Education	0.461**		
	Farm size	0.257*		
	Farming experience	0.291**		
	Annual family income	0.171 ^{NS}		
	Boro cultivation area	0.247*		
	Use of GSOM on boro rice cultivation	0.447**		
	Knowledge on boro rice cultivation	0.674**		
	Attitude towards the use of GSOM on boro rice	0.536**		
	Problem faced in using GSOM on boro rice	-0.281**		

NS = Non significant, * = Correlation is significant at the 5% level, ** = Correlation is significant at the 1% level

A large number of middle aged knowledgeable moderate educated farmers with medium to high farming experience have a positive attitude towards the use of GSOM on boro rice cultivation in their medium to large farm because of positive impact of GSOM on soil and environment but most of them faced in using the product. Agriculture extension provider can take necessary action to increase the agricultural knowledge and the concern authority could take necessary action such as marketing, price fixing, easy availability of GSOM to minimize the problems in using GSOM on boro rice cultivation. However a small piece of study can not provide all information for the proper understanding of the environmental impact of using GSOM on boro rice cultivation. Therefore similar research should be further undertaken on the use of other organic manures.

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