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Adoption of Farming Technology by the Charland Farmers

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Abstract

The main objective of this study was to determine the extent of adoption of farming technology by selected char land farmers. The study was conducted in Monsurnagar union of Kazipur upazila under Sirajgonj district. Data were collected from randomly selected 120 charland households heads using pre-tested interview schedule during May to June 2010. Majority of the respondents were found middle aged having primary level of education, medium family size, small farm size, medium income, moderate farming experience and low contact with information sources. Charland farmers are using different technology for management of diversified farming systems like crop, livestock and poultry, fisheries and homestead agroforestry. Majority of the respondents (41.7%) were medium category in adoption of different farming technologies whereas 40 percent respondent had low adoption and only 18.3 percent respondent had high adoption. Charland farmers are practicing some promising technologies like goat rearing, pigeon rearing, beef fattening, cultivation of vegetables in homestead areas and cultivation of spices and condiments in shady places. Education, farm size, family size, annual income and contact with the sources of information showed significant positive relationship with their adoption of farming technology.

Keywords: *Farming technology, adoption, charland.*

Introduction

The chars - some midstream islands and others attached to the mainland - are created from river sediment and are in a constant state of formation and erosion. Charlands are newly developed lands in different riverbeds and basins which comprise the area of 1818400 ha (app.) in five AEZ bearing active floodplain landscapes with variable geological materials and hydrological agro-climatic conditions (Farid, 2001).

The whole of the charland is unstable and prone to annual flooding. An estimated 6.5 million people live on the chars and associated erosion and flood-prone areas, over 5% of the Bangladeshi population (4.89 million on the main river charlands and the rest on the coastal chars). Char dwellers in particular are marginalized from the benefits of mainland Bangladesh society due to poor communication networks (Thornton, 2000). There are few opportunities for employment in char areas where most of the people make a living from growing crops, raising cattle and harvesting fish. Land is the most important resource in the chars, but poor households lack the support they need to utilize it fully, including poor access to technical advice and training, agricultural supplies and market facilities (Mahmud, 2008). The entire crop production depends on the traditional systems. The very dense population (Anon, 2009: 977 per sq. km; by

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the year 2030 it could be 1500 per sq. km), autonomous methods of cultivation and yearly flood hazards are factors which have a negative influence on food availability over time. As a result of river erosion cultivable land, crops and homestead areas are often damaged or devoured by rivers regularly. Adoption of modern agricultural technology undoubtedly will increase agricultural production and thereby will improve the living standard of the farmers (Hoque *et al.*, 2010). There is dearth of study reports to address the management of farming systems through different technology in charland of Bangladesh. Considering the above factors, charland areas have been selected for the present study with the following objectives: i) to describe the extent of adoption of farming technology by charland farmers and ii) to determine socio-economic characteristics of the respondent and their relationship with adoption of farming technology.

Methodology

The study was conducted in Kazipur Upazila of Sirajgonj district taking Maznabari and Charchinna villages from Monsurnagar union. Total number of farmers in the two villages was 445 which constituted population of the study of which, 120 farmers were selected randomly as the respondents covering 27 percent of active population. A pre-tested interview schedule was used to collect data from the respondents during May to June 2010. Age, education, family size, farm size, farming experience, annual income and extension contact of the respondent was considered as independent variable whereas adoption of farming technology was considered as dependent variable of this study.

Adoption of farming technology was determined as same as Aurangozeb (2002). A four point Likert type scale was used for computing the extent of adoption of farming technology score. Weightage of the responses against each technology were assigned in the following way. Scores of 0, 1, 2 and 3 were assigned for "no use", "low use", "medium use" and "high use", respectively. The weightage of responses of all the farming technologies adopted by an individual respondent were added together to obtain the extent of adoption of farming technology. For a better understanding regarding the particular farming technologies adopted by the respondents, a Technology Adoption Index (TAI) was computed. The TAI was calculated by multiplying the frequency counts of each of the technologies with its corresponding weights such as 3 for "frequently", 2 for "occasionally", 1 for "rarely" and 0 for "not at all". By adding all the values of each cell together, the score of TAI was calculated .The TAI for each technology could range from 0 to 360 where zero indicating 'not at all', while 360 indicating 'high adoption' of such farming technologies. Statistical measures like number, range, percent, mean, standard deviation and Pearson's correlation coefficient 'r' were calculated using SPSS program.

Findings and Discussion

Adoption of crop management technology

The computed TAI regarding the adoption of crop management technologies on individual aspects of different technologies are shown in Table 1.

Information displayed in Table 1 shows that the use of chemical fertilizer, use of STW (diesel) and use of hand sprayer were ranked first, second and third respectively. Reason behind higher use of chemical fertilizer might be due to respondents' awareness on fertilizer application, availability of fertilizer and low soil fertility in the study area. Due to boro rice dominant cropping system followed by chili, wheat, vegetables and suitable price of the STW, farmers were frequently using STW. Haider (2010) conducted a study to describe the adoption of technology by the IPM club members found that chemical fertilizer, proper water management and modern varieties of rice were frequently adopted by the IPM club members.

Table 1 Technology adoption index of crop management technologies

Name of technology	TAI	Rank order
Chemical fertilizer	217	1
STW (diesel)	207	2
Hand sprayer	205	3
Modern /improved variety	174	4
Power tiller (diesel)	169	5
Use of quality seed	169	5
Use of IPM method for pest control	145	6
Paddle thresher	50	7
Treadle pump	18	8

Adoption of livestock and poultry management technology

The computed TAI regarding the adoption of livestock and poultry management technologies on individual aspects of different technologies are shown in Table 2.

With regard to the adoption of livestock and poultry management technologies, goat rearing, Pigeon rearing and Beef fattening were ranked first, second and third position respectively. Reason behind that might be due to involvement of female members and children, availability of fodder in charland areas, profitability of goat, cattle and pigeon rearing and easy management skill requirement; charland farmers highly adopting such technologies. Haider (2010) conducted a study to describe the income generation activities of IPM club members found that majority of the respondents occasionally adopted cattle, goat, poultry and beef fattening technology for income generation.

Table 2. Technology adoption index of livestock and poultry management technologies

Name of technology	TAI	Rank order
Goat rearing	192	1
Pigeon rearing	173	2
Beef fattening	145	3
Rearing developed variety poultry	140	4
Vaccination of poultry bird	139	5
Improved housing	133	6
Use of modern breed	120	7
Use of feed (balanced diet)	102	8
Use urea molasses block for beef fattening	78	9
Artificial insemination in livestock	29	10

Adoption of fisheries management technology

The computed TAI of fisheries management technologies on individual aspects of different technologies are shown in Table 3.

Information presented in Table 3 reveal that poly culture of fish, use of modern breed and cultivating of fast growing fruit trees on the pond banks were ranked first, second and third positions, respectively. From Table 3, it can be concluded that adoption of technology for fisheries management is not satisfactory in charland areas. Reason behind the low adoption might be due to unavailability of modern breed of fishes in charland areas, majority of the respondent catch fish from backyard pond, river and canals, lack of commercial fish cultivation system, lack of knowledge on commercial fish culture, lack

of transport system and lack of information sources.

Table 3 Technology adoption index of fisheries management technologies

Name of technology	TAI	Rank order
Poly culture of fish	88	1
Use of modern breed	72	2
Cultivating of fast growing fruit trees on the pond banks	68	3
Production of fodder on the bank of pond	63	4
Proper water management	62	5
Apply supplementary feed of fish	56	6
Use of feed (balanced diet)	50	7
Urea molasses apply in the pond	32	8

Adoption of homestead agroforestry management technology

The computed TAI regarding the adoption of homestead agroforestry management technologies on individual aspects of different technologies are shown in Table 4.

Table 4 reveals that cultivation of vegetables in homestead areas got highest score and ranked first. Reason behind high adoption might be low cost, easy management, consciousness on proper utilization of land area, involvement of female and children in homestead vegetable cultivation. Cultivation of spices and condiments in shady place and cultivation of fast growing forest tree got second and third rank position.

Table 4 Technology adoption index of homestead agroforestry management technologies

Name of technology	TAI	Rank order
Cultivation of vegetables in homestead areas	223	1
Cultivation of spices and condiments in shady place	167	2
Cultivation of fast growing forest tree	148	3
Production of vegetable seed	147	4
Cultivation of improved fruit trees	145	5
Pruning of fruit trees	116	6
Raise seedling in the nursery	106	7
Modern method of harvesting	93	8
Food processing for sell	15	9

Overall adoption of farming technologies by the respondents in different farming system

The score obtained for overall adoption of farming technologies by the respondents ranged from 07 to 87 with an average of 37.56 and standard deviation of 20.86. The respondents were grouped into three categories on the basis of mean and STD of overall adoption of the farming technologies (crops, livestock, fisheries and homestead agroforestry) are given below in Table 5.

Data presented in Table 5 shows that the highest portion of respondents (41.7%) with medium adoption of farming technologies whereas 40 percent respondents had low adoption and only 18.3 percent had high adoption.

Table 5. Distribution of the respondents according to their overall adoption of farming technology

Category	No. of respondents (N=120)		Mean	SD
	Number	Percent		
Low use (up to 27)	48	41.70	37.56	20.86
Medium use (28 to 47)	50	40.00		
High use (48 & above)	22	18.30	Observed range = 07- 87	
Total	120	100	Possible range = 0-108	

Rahman (2003) found that about half (47%) of the growers had medium adoption, 44 percent had low adoption and 9 percent had high adoption of year-round homestead fruit cultivation practices. Aurangozeb (2002) conducted a study on adoption of integrated farming technologies by rural women of RDRS in Lalmonirhat district found that highest proportion (71%) of rural women had high, 21 percent medium and 8 percent had low adoption of integrated farming technology. Haider (2010) conducted a study to describe the adoption of technology by the IPM club members found that 65 percent of the IPM club member had high to very high level of technology adoption, about 23 percent had medium level and remaining 12 percent had low level of adoption. Reason behind low adoption of farming technology by the char land farmers might be illiteracy and low contact with information sources.

Relationship between socio-economic characteristics of the respondents and adoption of farming technology

Findings indicated that age of the charland farmers was not an important indicator concerning the adoption of farming technology, but the level of education and adoption of farming technology were significantly and positively correlated (Table 6). That is, the educated farmers are more interested in adoption of farming technologies. Aurangozeb (2002), Akter (2007) and Sardar (2002) found the same results in their respective studies. Farm size of the respondent had significant relationship with their adoption of farming technology. Majumder (2006), Islam (2008) and Akter (2007) found the same results in their respective studies. Family size and annual income of the respondent had significant positive relationship with their adoption of farming technology. That is, the more the annual income of the respondents, the more they adopted farming technologies. It implies that with increased income, respondents were able to procure inputs for farming so that they invested more which brought for them higher income. This findings support the earlier findings of Reza (2007). Contact with the sources of information had significant positive relationship with their adoption of farming technology. It indicates that extension contact had immense influence on the adoption of farming technology of the char land farmers. It is obvious that contact with extension agents and others extension teaching methods might have change the attitude of clients and thus they become interested to adopt new technology which might have been reflected here. Reza (2007), Aurangozeb (2002), Hossain (2006) and Sardar (2002) found the same results in their respective studies.

Table 6 Correlation coefficient between socio-economic characteristics of the respondents and their adoption of farming technology

Socio-economic characteristics	Coefficient of correlation ('r')
Age	-0.140
Education	0.388**
Family size	0.413**
Farm size	0.474**
Annual income	0.730**
Farming experience	-0.187*
Contact with the sources of information	0.604**

* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

Conclusions

Findings indicated that char land farmers are using different farming technology in their farming enterprises (crops, livestock, fisheries and agroforestry).The majority of the charland farmers had low to medium level adoption of farming technologies. So, there remains further scope to increase the level of adoption of farming technologies. For this, there is a need for strengthening extension services by GOs and NGOs to ensure a continuous flow of information and technical know-how to the charlanders for enhancing their skills and knowledge in the respective areas. Adoption of farming technologies by the charland farmers was increased with higher level of education, larger farm and family size, higher annual income and greater contact with sources of information. It implies that, the socio-economic characteristics of the char land farmers have profound influence on their adoption of farming technology. Therefore, government (specially DAE) and non-government (CARE,CLP) development initiatives should consider these attributes while formulating any capacity strengthening programs and projects related to management of charlands.

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