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Farmers' Communication Exposure to Rice and Poultry Farming

Md. Mahfuzul Huque[1]
Ataharul Huq Chowdhury[2]
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Abstract

This study was undertaken to analyse farmers' communication exposure to rice and poultry farming on a comparative approach. Determination of farmers' communication exposure together with their knowledge of rice and poultry farming on a comparative approach, exploring relationship of selected characteristics with the communication exposure, determination of preference of media and identification of recipients of message were the analytical issues in this study. Data were collected using structured interview schedule from 56 farmers of three unions of Bhaluka Upazila, Mymensingh district. The findings of the study revealed that majority of the farmers had low to medium exposure to both rice and poultry farming. The 'information crisis' in the locality might have been mediated by innovation characteristics, message-gap assumption, role of interpersonal network, social participation etc. Farmers' had significantly more communication exposure to rice farming compared to that in poultry farming. On the other hand, they had more significant knowledge of poultry farming than that of rice farming. Out of six selected characteristics only education had significant positive relationship with farmers' communication exposure to both rice and poultry farming. Government extension agent seemed to be less effective and credible regarding poultry farming information diffusion. Farmers perceived themselves as important receiver of rice and poultry farming message.

Key words: *Communication exposure, rice farming, poultry farming, message recipient*

Introduction

In Bangladesh, amid the contribution of agriculture to national GDP, 22.8 percent comes from crops, 3.3 percent from fisheries, 3.2 percent from livestock and 2.3 percent from forestry (BBS 1999). Thus, the importance of agriculture in the economy of Bangladesh can hardly be overemphasized. Rice is the major food crop in Bangladesh, which covers 72.86 percent of total cropped area. Rice alone constitutes 95 percent of the total grain production in Bangladesh (Julfiqar *et al.*,1998). However, the average yield of rice is around 2.8t/ha at present (AIS, 1999) which is less than the world average of 2.9 t/ha and frustratingly much below the highest producing country average in Korea (6.8 t/ha).

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Poultry is one of the most important and promising industrial sectors for the economic development of Bangladesh. The Food and Agriculture Organization (FAO, 1999) estimated poultry population in Bangladesh to be at 156 millions chickens and 13 million ducks. Poultry droppings are a good bio-fertilizer for agricultural crops, fish food and a good source of gas for fuel produced by fermentation. Poultry farming in Bangladesh have considerable potentiality for providing employment opportunities.

The farming systems of Bangladesh were lately concentrated to producing field crops mostly. But many farmers have been now engaged in both field crops and poultry farming. Thus, poultry farming is now in serious competition with crop farming, especially rice. In 2000-2001, rice along with wheat was produced nationally to the tune of 2,67,00000 metric tons and the number of poultry (hen) produced was 17,51,30,000 (AIS, 2003). However, the attributes of these two innovations have been interlocked in many ways. In fact, based on Rogers (1995) model, five variables affect rate of innovation diffusion which are: (i) attributes of innovations, (ii) type of innovation-decision, (iii) communication, (iv) nature of social system and (v) extent of agent's promotional efforts.

The diffusion of poultry technology to the client systems through planned extension service lagged behind than rice research technology diffusion. In Bangladesh, enough has been studied in rice technology diffusion, but relatively much less on poultry technology diffusion. Communication campaign is aimed at influencing the cognitive domain of the client systems mostly. Thus, it is necessary to conduct a communication research on a comparative approach on the diffusion of rice and poultry technology. This kind of study taking both communication exposure and knowledge of rice and poultry farming on comparative approach was not attempted before. With this background, the present study has been undertaken to fulfill the following specific objectives.

Objectives

i. to compare farmers' exposure in communication media on the rice and poultry innovations
ii. to determine farmers' preference of communication media
iii. to identify the recipient of the messages for both rice and poultry farming
iv. to explore the relationship between farmers' selected characteristics on the one hand, and their exposure to communication media for rice and poultry production, on the other
v. to determine and compare farmers' knowledge of rice and poultry farming

Methodology

Locale of the Study: Two villages namely Dhamsour and Mallikbari under Mallikbari union, four villages namely, Habirbari, Masterbari, Kasurgarh and Paragaon under Habirbari union and four villages namely, Kachina, Kadigarh, Batagor and Palgaon under Kachina union were purposively selected as the locale of the study. All these were under Bhaluka upazila of Mymensingh district. The rationale behind the selection of these villages was that the farming systems here were lately concentrated to producing field crops mostly. But many farmers were newly engaged in both poultry and rice farming.

***Population and Sample*:** A list of the farmers who were engaged in both rice and poultry farming was prepared with the help of the concerned Block Supervisors[4]. There were 56 farmers of this category. Thus, data were collected from the population rather than the samples.

Measurement of the Variables: Exposure to communication media for rice farming refers to one's extent of exposure to different media for rice messages over a year prior to data collection. The extent of contact was determined against six point rating scales having the expressions- not at all, yearly, quarterly, monthly, weekly and daily. The scores was assigned to these were 0, 1, 2, 3, 4 and 5, respectively. Communication exposure of a respondent was determined by adding the scores against 18 extension media of which eleven were personal media, three were group media and four were mass media. Thus, the communication exposure score of a respondent could range theoretically from 0 to 90, where zero (0) indicates no exposure and '90' does highest level of exposure. Similar technique was followed to measure communication exposure for poultry farming. Thus, the theoretical range of communication exposure score of poultry farming was same as in case of rice farming.

The knowledge of a farmer on various aspects of rice cultivation was measured using a test that consisted of twenty (20) items of which ten were 'multiple choice' and ten were 'true-false' in nature. A score of one was given for correct answer and zero for no or wrong answer. Thus, the score could theoretically range from zero (0) to 20, zero indicating no knowledge and 20 as highest level of knowledge of rice farming. The knowledge of farmers on various aspects of poultry farming was also measured by conducting a test following similar techniques where test score range was zero (0) to 20. The measurement techniques of the selected characteristics of the farmers were as follows:

Age: It was measured in terms of actual years from his birthday to the day of interview. A score of one (1) was assigned for each year of age.

Education: It was measured based on the number of years a respondent had completed in formal schooling.

Family size: It was measured by the total number of members in the family of a respondent.

Family education: The individual score for all the members of a respondent's family were added together and divided by the total number of family members excluding, however, those of five years or less considering five as the school going age.

Farm size: Farm size was measured in hectares on the basis of the land area cultivated by the respondent.

Organizational participation: It was computed based on participation of a respondent in different organizations over the last five years.

Data Collection and Analysis: Data were collected using a structured interview schedule. Various descriptive statistical measures such as range, frequency, number, mean, percentage, standard deviation were used for categorization and description of the variables. Pearson's Product Moment Correlation Co-efficient (r), t-test, Chi-square were used depending on the level of measurement and the objectives of the study.

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[4] *Block Supervisors are the field extension workers of the Department of Agricultural Extension who are assigned at grass-root level. Now the position has been renamed as Sub Assistant Agricultural Officer (SAAO)*

Results and Discussion

Farmers' Comparative Exposure to Communication Media for Rice and Poultry Farming Messages

Farmers' comparative communication exposure regarding two different farming messages was the focus of the study. Based on the observed communication exposure score farmers were classified into different categories shown in table-1 along with the result of t-test.

Table 1: Farmers' Communication Exposure to Rice and Poultry Farming

Communication exposure	Observed range		Mean	Standard deviation	Categories with score	Farmer		Observed t -value for mean difference of communication exposure in rice and poultry farming
	Minimum	Maximum				Number	Percentage	
Rice farming	16	35	23.05	4.69	Low (up to 20)	24	43	7.78***
					Medium (21-30)	27	48	
					High (above 30)	5	9	
Poultry farming	15	30	20.73	3.79	Low (up to 20)	30	54	
					Medium (21-30)	26	46	
					High (above 30)	0	0	

****Significant at 0.001 level of probability with 55 df*

Data presented in the Table-1 indicate that 43 percent of the rice farmers had low exposure, while 48 percent had medium exposure and only a negligible of 9 percent had high contact with various extension media for getting rice-farming messages. On the other hand, more than half of the farmers had low exposure, 46 percent had medium exposure to various communication media for getting poultry farming messages. Neither of them had high contact with extension media for getting poultry farming messages. Media exposure is very important for receiving farm information through various communication methods. The findings manifest that farmers' exposure to communication media for two different types of farming information is relatively low. This might reflect that an "*information crisis*" phenomenon exists in that community. This is more pronounced in case of poultry farming messages. On an average, it seems that farmers' communication exposure for rice messages stands generally at higher level than their exposure for poultry messages. This can be observed by a significant 't' value as shown in the Table-1.

Table-2: Contingency Table Showing Communication Exposure Level of the Farmers in Rice and Poultry Farming

Communication exposure for rice farming	Communication exposure for poultry farming		Total	Observed χ^2 value
	Relatively low (up to 20)	Relatively high (above 20)		
Relatively low (up to 20)	22	2	24	24.26***
Relatively high (above 20)	8	24	32	
Total	30	26	56	

****Significant at 0.001 level of probability*

Table-2 reveals that farmers having relatively low exposure to communication media were more compared to those having low exposure in case of poultry farming message. This difference for communication exposure of two different types of farming was statistically significant as indicated by χ^2 statistics. The messages of rice farming were available through more specific media than that of poultry simply because extension organizations for rice and other agricultural field crops, like DAE has gone down to the grass root level of the community. But the Department of Livestock Services and other related organizations have field workers at the upazila level only. They have no grass root level livestock extension worker. Thus, the level of farmers' exposure for rice farming has been generally higher than that of the poultry farming.

Farmers' Preference for Communication Media in Getting Rice and Poultry Farming

From a list of 18 communication media farmers were asked to express their preference in the rank order for rice and poultry farming messages. The details of their preference are shown in the table-3. Table-3 indicates that individual method occupied the first three ranks in consecutive orders as preferred by rice farmers. Among the mass media, television was placed in the forth rank and newspaper at the negligible last. Group discussion, was preferred to a negligible of fifth rank. On the other hand, in case of poultry farming three communication media were preferred in descending order i.e poultry drug company, poultry feed dealer and neighbors.

The number of media having preferred came down from six in rice to three in poultry farming; and only neighbour was common preference in both the list.

Identification of Major Recipients of Rice and Poultry Production Messages

The respondents were asked to mention the members who should be the major recipients of rice and poultry production messages using closed form questions. The findings revealed that 59 percent of the farmers preferred themselves as the major recipient of rice farming messages and 41 percent of them felt that major recipients of rice messages should be both of themselves and a little portion of other family members (excluding wife).

Table-3: Farmers' Preference for Communication Media for Rice and Poultry Farming

Sl. No.	Communication media	Number of the respondents at their preference level				Preference index	Rank order
		First preference (3)	Second preference (2)	Third preference (1)	No. preference (0)		
	For rice farming						
1.	Block Supervisor	19	10	12	15	89	1
2.	Family members	16	5	11	24	69	2
3.	Neighbour	5	19	15	17	68	3
4.	Television	11	9	4	32	55	4
5.	Group discussion	5	11	9	31	46	5
6.	News paper	0	2	1	53	5	6
	For poultry farming						
1.	Poultry drug company	30	24	2	0	140	1
2.	Poultry feed dealer	23	29	4	0	131	2
3.	Neighbour	3	3	36	14	51	3

On the other hand, 64 percent of the farmers perceived that they alone should be the major recipients of poultry farming messages and two percent of them perceived that their wives along with them should be the recipients. Further, 23 percent of the respondents perceived that they themselves and other family members (excluding wife) should be the recipients and 11 percent of them perceived that they themselves, their housewives, and other family member should be the recipient of poultry farming messages.

Thus, respondents' perception in the issue gives much more importance in themselves as a unit of receivers. Farmers perceived women as non-recipient and negligible recipient for rice and poultry farming messages respectively. Huque (1993), quoting Agricultural Sector Review Survey, held in Bangladesh, 43 percent women have agriculture as their primary occupation and 12 percent as secondary occupation. Women are the major human resources, especially in conducting post-harvest technology in rice and other field crops. On the other hand, hired labourers who are employed in large number in field crop cultivation and especially in poultry farming were not being perceived as the recipients of messages. One explanation could be that the male farmer owners want to maintain a monopoly of farming messages over the other counterparts of the family and the society. Huque (1990), reviewing contemporary researches, observed that a '*message-gap assumption*' exists between the big and relatively small farmers. The present findings tend to suggest that the '*message-gap assumption*' might also exist between the farmers vis-a-vis other group of recipients- the wives and hired labourers.

Farmers' Selected Characteristics

The salient features of farmers' selected characteristics are shown in Table-4. The table indicates that 72 percent of the farmers belonged to the young and middle aged groups. Thus, it can be assumed that an overwhelming majority of the farmers could generally be considered as more

energetic and innovative and they are likely to hold influence for community decision making in the diffusion of rice and poultry innovation. Ninety five percent of the rice and poultry growers were educated which varied from primary to above secondary levels and 73 percent of them had medium to high family education. As education helps to take innovation decision rationally it can be assumed that farmers in the study area are in a favourable position as far as their innovative behaviour is concerned.

Table-4: Salient Features of the Individual Characteristics of the Farmers

Selected characteristics and categories	Farmer		Mean	Standard deviation	Range	
	Number	Percent			Minimum	Maximum
Age (years)						
Young (up to 35)	10	18				
Middle aged (36-50)	30	54	44.18	8.18	25	60
Old (above 50)	16	28				
Education (score)						
Illiterate (0)	3	5				
Primary level (1-5)	4	7	8.80	3.50	0	16
Secondary level (6-10)	34	61				
Above secondary (above 10)	15	27				
Family size (number)						
Small (2-4)	11	20				
Medium (5-6)	28	50	5.82	1.64	3	9
Large (above 6)	17	30				
Family education (score)						
Low education (1-3)	15	27				
Medium education (4-6)	34	61	4.24	1.52	1.75	8
High education (above 6)	7	12				
Farm size (hectare)						
Small (up to 1)	33	59				
Medium (1.1-3)	23	41	1.03	0.51	0.36	253
Large (above 3)	0	0				
Organizational participation (score)						
No participation (0)	21	38				
Low participation (1-8)	11	20				
Medium participation (9-18)	19	34	7.36	7.23	0	27
High participation (above 18)	5	8				

It seems that the family planning campaign in the study area has been somewhat successful since 50 percent families had less than the national average size. The average farm size of the respondents was 1.034 ha which is higher than the national average (0.18 ha). It implies that the living of the people in the study area could be improved than those of a typical farming community of Bangladesh. On the other hand more than half of the farmers had '*no*' to '*low*' organizational participation, which seemed to be unfavourable condition for the farmers to become exposed to different communication media.

Relationships Between Selected Characteristics of the Farmers and Their Exposure to Communication Media for Rice and Poultry Farming

Table-5 indicates that only farmers' education had significant positive relationship with their exposure to communication media for both rice and poultry farming message. Other characteristics such as, age family size, family education, farm size and organizational participation had insignificant relationship with farmers' communication exposure for both rice and poultry farming.

Table-5: Coefficient of Correlation Showing Relationship Between Farmers' Selected Characteristics and Their Communication Exposure for Rice and Poultry Farming

Farmers' selected characteristics	Correlation coefficient with farmers' communication exposure	
	For rice farming	For poultry farming
Age	-0.192	-0.167
Education	0.334**	0.387**
Family size	-0.209	-0.098
Family education	0.212	0.113
Farm size	0.020	-0.042
Organizational participation	0.043	0.000

Significant at 0.01 level of probability

It is observed in most studies that education plays a significant role in farmers' exposure behaviour. One explanation is that educated person generally becomes rational and innovative towards accepting new ideas and practices. Thus, they are likely to be updated in all farming messages. Secondly, education increases the capacity of a farmer to get messages from the mass media – especially the print media. These may be the phenomenon that education influences communication behaviour of the client systems regarding two different types of farming. Age, education, family education, farm size, organizational participation and family size had no significant influence on farmers' communication exposure. Family members can form a communication network regarding any development message. It seems that family members did not form any communication network within themselves. Thus, whatever have been the exposure level of the farmers, this might have come from the outside the family.

Farmers' Comparative Knowledge of Rice and Poultry Farming

Changes in the cognitive and affective domain are the effect of any communication campaign. Whatever had been the level of exposure, an attempt was made to ascertain the knowledge levels of the farmers in rice farming and poultry farming. Based on their knowledge scores the farmers were classified into different categories and presented in the Table-6 along with the result of t-test. Data indicate that only half (52 percent) of the farmers possessed medium to high knowledge of rice farming where an overwhelming (71 percent) possessed medium to high knowledge of poultry farming.

Table-6: Farmers' Knowledge of Rice and Poultry Farming

Farmers' Knowledge	Observed range		Mean	Standard deviation	Categories with score	Farmer		Observed t- value for mean difference of knowledge on rice and poultry farming
	Minimum	Maximum				Number	Percentage	
Rice farming	10	16	12.59	1.58	Low (up to 12)	27	48	4.724***
					Medium (13-15)	27	48	
					High (above 15)	2	4	
Poultry farming	10	17	13.61	1.67	Low (up to 12)	16	29	
					Medium (13-15)	32	57	
					High (above 15)	8	14	

****Significant at 0.001 level of probability*

The average poultry farming knowledge of the farmers was more compared to that of rice farming. This difference is statistically significant as found by t-value. Rice has been the first enterprise that entered into the farming system of Bangladesh. Also the highest attention has been given to rice research and extension than any other crop. But the farmers' knowledge generally does not show that they possessed a satisfactory knowledge of that crop cultivation. On the other hand, poultry farming is a very recent and sensitive enterprise and requires sound knowledge for its efficient management.

The fact that farmers generally possess more knowledge of poultry farming than that of rice farming is a matter of realization from entrepreneurship frame of reference. Characteristics of the entrepreneurs, especially in poultry, the characteristics of the innovation and farmers' nature of decision- making for example, optional versus centralized- all contribute importantly for diffusion of innovations. On the characteristics of poultry as an innovation, the farmers might have perceived it in a favourable direction on relative advantage, compatibility with the farming system in social context, less complex, can be tried with whatever inputs could be provided and the results can be observed immediately. Further, there are many marketing outlets to the nearby capital metropolis with good physical communication system. On the decision unit, the frame lies on optional type with democratic philosophy of extension and not a centralized one with compulsion. All these social and environmental factors, which lie more in favourable terms, might have led the rice farmers to be entrepreneurs in poultry farming. And hence, their knowledge level in poultry farming generally by passed that of rice farming.

Conclusion

Farmers' unsatisfactory exposure to different communication sources for development messages indicates existence of "*an information crisis*" in the locality. Though poultry farming requires scientific and up to date information the government agency in this regard seems to be less credible and efficient. Farmers' relatively more communication exposure for rice farming message

might be due to grass root extension work conducted by DAE and other organizations. The prevailing '*message gap assumption*" might have hindered the communication network where interpersonal methods like neighbour were seemingly hold important role for diffusion of innovation. However, education has been the precursor of communication behaviour of the farmers to all media. The role of other five independent variables seems to be less functional which is hard to delineate. Lack of family networks and social participation could be hindering for having farmers' enough exposure to development messages. Though farmers had more communication exposure for rice farming compared to that of poultry farming their poultry farming knowledge was significantly higher than their knowledge of rice farming. Thus, it may conclusively be observed that a "*mere exposure phenomenon*[i]" (Tan, 1981) has occurred in the communication behaviour for rice farming messages. By contrast, the exposure and receiving behaviour for poultry messages has been following a direction opposite to the "*mere exposure phenomenon*", which communication specialists need to develop a phenomenon- different from that the "*exposure phenomenon*".

[i] *According to mere exposure phenomenon the influence (change in cognitive and affective domain) of communication media is progressively increased upto certain level. After that level, the influence might be decreased with the increase of campaign due to saturation of information, reluctance of the receiver on similar topic, introduction of new topic etc.*

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From Concept to Innovation: Insights Towards Participatory Technology Development in Bangladesh

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Abstract

Farmers in developing countries like Bangladesh are often bypassed by the technology generation process leading to inappropriate technologies development. In this paper the process and methodologies that helped overcoming these constraints in Bangladesh, based on a case study of community developed multipurpose seed drying tables. For relatively simple technologies such as seed drying, seed storage and seed quality, introducing concepts through learning based approaches, rather than entering the community with a tailor-made technology, substantially increases the adoption rate. The approach triggers the collaborative and creative thinking process, resulting in a multitude of different seed drying table designs and uses. Feedback from peers through innovative platforms like a village picture exhibition and a Going Public session helps refining and broadening the technology, while at the same time serving as a dissemination platform for farmer-to-farmer extension. The paper describes discovery learning towards developing technologies with, rather than for farmers.

Introduction

In Bangladesh mechanisation has taken place to some extent over the past years, and mainly with relation to land preparation and threshing but paid little attention to issues like seed drying and storing. This is surprising because 95% of the rice seed is currently farmer-saved and hence improved post-harvest technologies could directly benefit both the household and national economy. A recently on-station developed combustion dryer, using rice bran as fuel and electricity to power a fan, was rejected by farmers because of its high price and difficulty to keep track of the right temperature.

Resource-poor farmers in developing countries are often bypassed by the technology generation process, partly because they lack the organisation to communicate their needs to technology designers or because of a lack of open-mindedness or willingness from the part of researchers. This is particularly problematic for the poorest people and when there exists no functioning platform.

Few papers exist on the actual participatory development of mechanical technologies, and, with some exception, participation is often limited to the first step of the process, namely the needs

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assessment. This is quite opposed to those related to natural resources management, indicating the particular focus in R&D policies of national centres, rather than the unwillingness of researchers to build participatory methods into their discipline.

The paper uses the development of multipurpose drying (MPD) tables for farmer-saved rice seed as a case study to demonstrate how learning based approaches can improve the development process of mechanical technologies, and ensure full ownership by its end users. It illustrates the importance of building on local knowledge, experiences and experimentation, and the role of outsiders in facilitating the innovation adoption and adaptation process.

Procedures

The seed Health Improvement Project (SHIP) was operated under the Poverty Elimination Through Rice Research Assistance (PETRRA) project in Bangladesh, as a collaboration between the Bangladesh Rice Research Institute (BRRI), the International Rice Research Institute (IRRI), CABI Bioscience, Rural Development Academy, Bogra and several government and non-government institutions.

The project operated in the seven agro ecological zones of Bangladesh with one key site and four villages in each zone. This paper describes experiences of working with the Rural Development Academy in their key site in Bogra, namely Maria village.

Qualitative information such as the origin of local innovative ideas added to the technology, as well as its use flexibility and expected durability, and quantitative measurements and cost assessments have been gathered through informal interviews during the frequent village visits, and through participatory methods during village meetings. As the whole process is part of the 'experiment', it will be described into detail under the next session.

Results and Discussion

Developing the Participatory Process

An overview of the different steps involved in the development and dissemination of the technology is given in Table-1. Participatory methods ought to be used in a creative and flexible way, and if needed in combination with other approaches depending on the local circumstances. Therefore, rather than giving a blueprint of few issues that need to be given due consideration.

Preparing the Ground: Before entering a community, a good understanding of the key issues and key players involved in seed health was required. The SHIP project has achieved this through a combination of range of activities such as literature review, expert interviews and multistakeholder workshops.

Once having a clear picture of the situation, entering the community and building rapport are the first steps in fostering a relationship with the end-users of the technology. But of course the question of which community to pick has to be resolved first. Depending on the objective of the project, the selection can be random, purposeful, through self-interest, adhoc or stratified (Bentley

& Baker, 2002). In case the focus is on participatory technology development, the potential for regular interaction and future collaboration will surely benefit the process. Although RDA had hardly any contact with Maria village before the on-set of the project, their close proximity has probably made both parties aware of the potential for future collaboration on other topics related to rural development, and has helped creating relationship of mutual respect and understanding. Anticipated mutual benefits are one of the driving forces of the participatory process.

Research Relevance and Community Enthusiasm: When collating global and local information, a whole range of interventions at the cropping and post-harvest level can be considered to improve seed quality. However, to avoid introducing of developing a technology that has a high chance of being rejected by farmers, the community should be the first filter of this range of potential intervention strategies.

A needs assessment through village group meetings and farmer workshops resulted in recommendations for participatory training on-farm research, and participatory technology development (Mc Allister & Van Mele, 2001). Seed drying in the rainy season was perceived as a major problem by all sites. The functional solution to this problem is the demand for improved seed drying. How to respond to this demand and to what extent farmers are involved is both technology- and location-specific, but will by and large determine the adoption level of the technology.

Table-1: Different Steps and Objectives in the Technology Development and Dissemination Process

	Steps in the process	Objectives
PLANNING	Background information evaluation	Review existing information related to seed health Define key sites for project intervention based on agro ecological and /or socioeconomic characteristics
	Community meeting and mobilisation	Introduce project staff, present project objectives and build rapport with target communities
	Community information gathering	Assess farmers' knowledge, attitudes and practices in rice seed management (Zakaria, 2000)
	Participatory needs assessment	Assess needs and constraints of community with regard to improving seed health in function of different social groups (McAllistar & Van Mele, 2001)
IMPLEMENTATION	Participatory technology development workshop	Train project staff in facilitating group discussions and the use of participatory methodologies in technology development
	Village house wives meeting	Introduce the concepts of ventilation and evaporation Stimulate creative thinking in the problem solving process Enhance project responsibility and ownership by women
	Village households meeting	Develop criteria for good multipurpose drying tables Stimulate discussion within and between households
	Developing drying tables	Develop tables based on general criteria developed by the community and responding to specific household needs and limitations

SCALING-UP	Steps in the process	Objectives
	Village picture exhibition	Create awareness among non-project staff Evaluate and get feedback on strengths and weaknesses of tables from project and non-project members Develop pride and ownership among participants
	Uptake pathways workshop	Evaluate performance of project staff and members Expose and train project staff in developing innovative dissemination strategies Explore scaling-up potential for the developed technology
	Going Public	Expose innovator farmers to a new platform for marketing their skills Get feedback from people from outside the village Enthuse local official to support farmer-to-farmer extension

Back-&Forth, for instance, is a method developed in Bolivia in the 1990s through which mechanical tools are developed and redesigned in the laboratory and on-station after several Back and Forth visits to the community for comments (Bentley & Baker, 2002). Although intended to build on feedback from farmer communities, mechanical engineers worked in the SHIP project developed a combustion dryer on-station, which uses rice bran as fuel and needs electricity to power the fan. Upon a first demonstration on-farm, farmers considered it too expensive and too difficult to keep track of the right temperature, and rejected this innovation. As many villages in Bangladesh do not have electricity yet, the project decide to abandon this idea and introduce a different approach.

Learning from past experiences, the project staff decided to focus activities on those topics identified by the communities as most relevant and for which a high potential for success and enthusiasm could be anticipated. Technologies should be accessible to resource poor farmers, environmentally friendly and gender-sensitive. Seed drying table was obviously one of the options that could be explored, although at this stage the project was a bit reluctant to go in with a pre-designed model. It was decided to introduce a concept rather than a technology through a learner-centred approach.

Designing, Developing and Validating the Technology: Because women in Bangladesh have the main responsibility for seed drying, a 2-hour session with 30 women of Maria village was organised immediately after the needs assessment meeting. A limited number of questions, embedded in real-world situations, were developed to stimulate the creative thinking process related to evaporation and ventilation. By the end of the session, women raised the idea themselves to develop drying tables. Both staff from RDA and the participating women felt empowered by this approach.

During the next session in June 2001, both men and wives were involved to stimulate household interaction. A matrix was established with major criteria for a good drying table (Table 2). This matrix with drawings made by the women, was transferred to an a4-sheet and delivered to the households. It served as a guiding sheet for the design of drying tables, as such bringing criteria developed and filtered by the community back to the household level.

No incentives were offered in terms of materials or financial contributions. Each household was left free to decide whether the technology would be useful for them or not, and hence whether to make a table or not.

During a next village meeting on seed drying nearly all of them had made a table and people had already some experience about the different benefits and constraints of their own MPD table.

Innovative Feedback Loops: To share experiences with other people in the community, a village picture exhibition was organised to further spread the idea and raise local awareness. In this participatory evaluation session, Participatory Rural Appraisal (PRA) tools were used such as matrix ranking and gender analysis to evaluate the strengths and weaknesses of the different designs. The picture exhibition provided a forum for the people to take a closer look at their own innovations and created proud among all the participants.

Table- 2: List of Criteria for Drying Table Developed by Maria Community Members

Criteria	Description
Seed drying	Drying should be possible in any season
Movability	The table should be easy to move so that the women can always shift the table to a place in their home yard where there is no shadow
Cost	The overall production cost should be kept to a minimum
Material	Materials used should be locally available
Height	The table should be high enough so that the seed is protected from chicken and playing babies who often mix seed from different varieties. Proper height should also relief back pain
Size	It should not be too big so that it can be moved easily by one or two people. The width is important in that, tables should preferably be easily taken through the door of the house in case it will be used for indoor purpose
Strength	Opinions were divided for this criteria. Some people wanted strong and enduring tables, while others said that if it would brake down after a year, that would be no problem because they can always make a new and better one as long as it is cheap
Multipurpose use	People also came up with clearly different ideas about what other functions the table should accommodate. Manual seed cleaning, threshing (which so far has been done by beating the panicles on the earthen floor), drying other materials, household purposes, dining table and baby cod were all possibilities mentioned at this stage
Slanting	This idea was actually introduced by the project staff, but was not retained in any of the designs
Folding type	One household had very limited space and suggested a foldable table, which they could put on their roof whenever not in use

A Going Public exhibition with different models of community-made drying tables was held at an important cross-road between two villages. Going Public is a method by which a two-way information flow is generated at an arena where people naturally gather, such as bus stops or weekly markets. Similarly, at this cross-road people tend to gather briefly for an informal chat, and

this enabled the project to get some extra feedback from non-participants. For using this new extension method in Bangladesh on post-harvest technologies such as drying and storage, the challenge will be to find opportunities to reach women directly.

Capacity Building: A Continuous Process: Because of the differences between the seven key sites and as the final decision of which intervention to target had to lay in the hands of the community, the project adopted a process-and results-oriented approach rather than a technology-oriented one, necessitating the organisation of a workshop on farmer participatory methods (Box-1). The global concepts and methods had to be understood first, before each team could act locally in their own site.

A major constraint in developing appropriate technologies is that both scientists and extension staff often come from non-farm backgrounds, have undergone an education based on technical skill development, and have no experience whatsoever in communicating with farmers at a level playing field. Therefore, communication and facilitation skills of scientists and extension people have been continuously upgraded. Capacity building of project staff was achieved through an interactive process of:

- Communicative learning community group discussion and experience sharing workshops with other project teams,
- Individual learning through household interviews and constructive self-evaluation sessions following community activities.

Box 1. Farmer participatory methods put a higher emphasis on either:

- generation of knowledge through participatory learning and action research or other discovery-based learning approaches
- generation of specific technologies through participatory variety selection, participatory technology development, etc.
- validation of on-station developed technologies through adaptive research, or
- validation of traditional technologies either on-farm or on-station

The role of the researcher-facilitator is to develop a judicious learning environment, provide appropriate learning tools, and empower the project team in being themselves able to trigger both communicative and individual learning at the community level.

Adopting and Adapting the Innovation

From Concept to Innovation: As the project did not introduce a technology, but rather the concept of evaporation and ventilation, the idea behind the technological innovation first conquered people's minds. Several households quickly put the ideas into practice, and these innovators served as examples for the rest of the community. Within about two months, two third of the participants had already adopted the innovation (Figure 1).

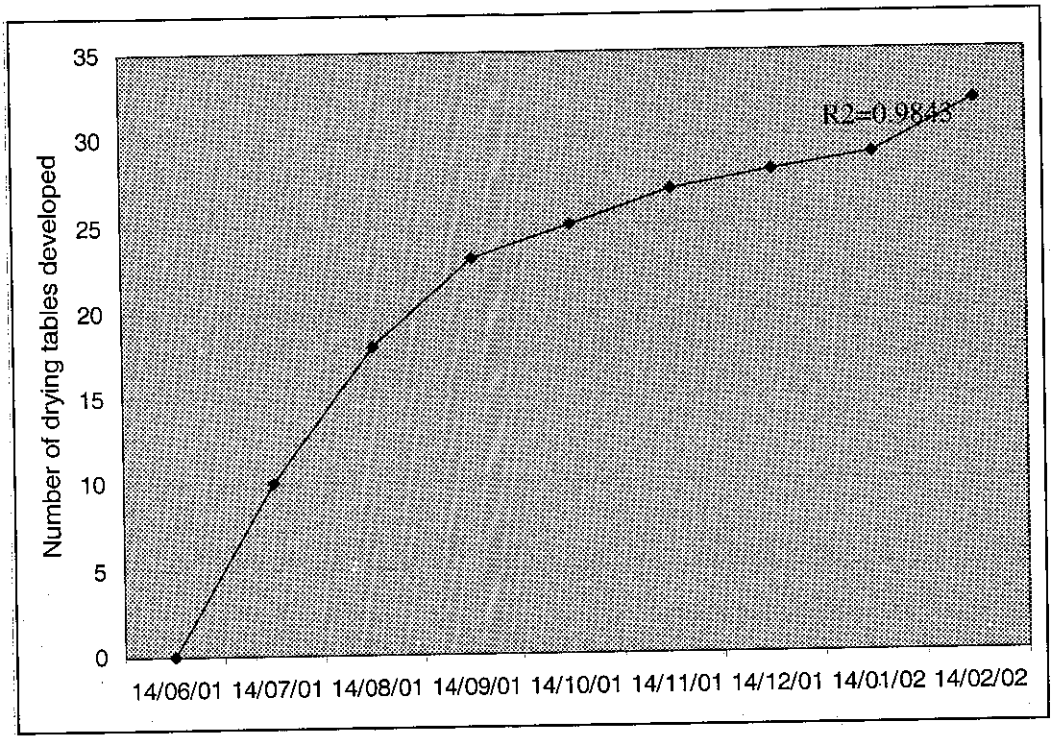

Figure1. Trend showing the adoption over time multipurpose drying tables at Maria village, Bangladesh

Households adopted the idea and made it into a technology that fitted their financial limitation and personal household needs (Table-3). Two clearly distinct ranges of designs evolved. The light tables can be easily used both indoors and outdoors for keeping kitchen utensils and drying other food stuff such as rice floor, herbs and fish. The heavy tables are mainly used for drying and threshing the rice seed. Threshing is traditionally done by beating the panicles on the earthen floor or on an iron drum. Due to the process-oriented approach, the project's initial focus on seed drying created an entry point for empowering households to improve other management practices such as threshing. Creativity and necessity have turned the drying tables in multipurpose drying tables.

Table- 3: Different Uses of Multipurpose Drying Tables, % of Households

	Heavy table (n=14)	Light table (n=16)	Total (n=30)
Drying different food stuff	57.1	75.0	66.7
Threshing	78.6	0.0	36.7
Seed drying (before sowing)	14.3	50.0	33.3
Kitchen cabinet	14.3	43.8	30.0
Drying of clothes, mattress, etc.	7.1	43.8	26.7
Outdoor relaxing bed	50.0	0.0	23.3
Storage table	28.6	12.5	20.0
Carom[1] board stand	0.0	6.3	3.3

[1]*Carom is a traditional game played by two or four people standing around a square table*

Generally the width of the tables is about 1 m (Table 4), which reflects the fact that most households want to take their table indoors when needed. The longer heavy tables also serve as outdoor relaxing beds among other uses. All heavy tables are lower than the light tables indicating the different ergonomic requirements of both tables: heavy tables are designed to be equally useful as threshing tables, whereas the light tables need to support activities for which an upright position is required.

Table- 4: Characteristics of Multipurpose Drying Tables Developed in Maria Village, m

		Heavy table (n=14)	Light table (n=16)
Length	Average	1.79	1.55
	Range	1.20-2.00	1.30-1.86
Width	Average	0.0	0.95
	Range	0.65-1.40	0.85-1.10
Height	Average	0.67	0.94
	Range	0.50-0.80	0.90-1.04

Gender Issues in the Design Process: Women being generally smaller than men raises the issue of gender compatibility in tool design (ILO, 1979; Jafry, 2001). In the SHIP project, only in one third of the cases wives had not been involved in the design of the MPD tables (Table 5), and those were regarded by the wives as either too high, or too costly. Having discussed these issues during a public meeting, further stimulant joined within-household decision-making by men and women about other issues than the drying tables.

Table-5: Contributors in Designing and Making of Multipurpose Drying Table, % of Households

	Designer			Maker		
	Farmer	Farmer + Wife	Farmer + Carpenter	Farmer	Farmer + Wife	Farmer + Carpenter
Heavy tables	35.7	64.3	-	-	42.9	57.1
Light tables	37.5	62.5	-	18.8	81.2	-
Total Average	36.6	63.4	-	10.0	63.6	26.7

Apart from its multiple uses mentioned above, women participants find it now much easier to manually clean their seed, which has a direct effect on crop performance. This training activity was introduced in the first two years of the project, but many women and farmers sound it straining for their eyes and back, as it was done on the floor. Human considerations should not only be limited to the technologies developed, but also to the project activities undertaken.

Over time, and as the project not only focused on the process, but also on achieving tangible results, participating farmers increasingly appreciated the family approach. Rather than inhibiting their women to participate, they started encouraging their wives and daughters to attend project activities. Women reported having gained more access to the household decision-making.

Mothers and Fathers of Invention: If necessity is the mother of invention, its father is new idea or a new piece of information (Bentley, 2000). Necessity was addressed from the early on-set of the participatory technology development approach and partly contributed to the approach being taken up so smoothly. It also explains how the introduction of a concept rather than a technology triggered the community to address other necessities such as threshing simultaneously.

Nonetheless, the father of invention is not only limited to new knowledge or a new idea. Innovative ideas were incorporated in the design of the MPD tables, not only based on new knowledge acquired through learning activities initiated by the project, but also based on insights from previous exposures or experiences that suddenly became relevant in solving a problem (Table 6).

Table-6: Inventive ideas added to the technology, based on new insights gained or previous exposures becoming relevant

Innovation	Description
Binding structure	Idea to bind different bamboo sticks together was taken from traditional roof binding technique
Folding type	The household that made a folding table reported to have got this idea from a folding camp bed, which they had once seen being used by a rich man
Polythene socks	Table legs were given polythene socks to prevent the wood from rotting. This idea developed after associating table legs with human legs
Food safety box cum table	One household integrated the innovation of a drying table with the existing idea of a box to keep food out of reach of animals such as rats
Carum board	Carum is a traditional game played by standing around a square table. A separate surface can easily be placed on top of this game and as such be used to dry seed
Polythene surface	A fertilizer bag is cut open and used as surface as this is easy to handle. When it suddenly starts raining the polythene sheet can be easily taken inside
Jute cloth surface	The project learning session on ventilation triggered the idea that if the wind could reach the seed at both sides, drying would be faster. This woman mentioned that a window screen would give good aeration, but as it was quite expensive, she used a jute clothe instead.
Jute cloth on corrugated sheet	People know that roof tops made from corrugated steel become very hot. This triggered the idea that by using an old piece of corrugated sheet covered by a jute clothe, the seeds will dry faster, as the heat comes both from above and below cloth, the seeds will dry faster, as the heat comes both from above and below
Multi-layered drying surface	Triggered by the learning session and combined with the necessity due to a lack of sufficient drying space in their home yard, this farmer used multiple layers of drying sheets at intervals of about 0.2 m

Farm Economics: Scientists and farmers often have a different perception of economics. An on-station developed combustion dryer was rejected by farmers because of its high price, although the engineers were really convinced that the device was cheap.

Table- 7: Cost Analysis of Multipurpose Drying Tables (US$)

		Heavy table (n=14)	Light table (n=16)
Actual cash cost	Average	2.5	0.2
	Range	0.3-4.7	0.1-0.4
Estimated non-cash cost	Average	2.9	0.8
	Range	0.5-6.3	0.5-1.1
Estimated total cost	Average	5.4	1.0
	Range	3.2-8.5	0.9-1.3

Scaling-up Potential

One of the challenges of whatever participatory method lies in reaching a large number of people with the same quality approach. Feder *et al.* (1999) described scaling-up as one of the generic problems in extension which can be partly overcome through mobilising other player in the extension process, empowering farmers and farmer organisations, decentralisation and use of appropriate media.

Allen *et al.* (2001) state that the use of linear approaches to extension are especially suitable for innovations developed primarily to increase productivity and /or reduce costs, whereas a more collaborative approach between scientists, extension and end-user is needed if we wish to change people's behaviour. To improve their thinking and decision-making skills in a dynamic environment, the learning has to be embedded in real-world situations.

Following this line of thinking, a seed drying device would be fairly straightforward promoted through linear extension. However, in the case of participatory technology development, we suggest to create an hybrid between the linear transfer of technology and the learning tools and messages that triggered the innovation process.

We aim to have farmers participate more in the content development of a broader range of educational programmes on seed health, of which improved drying is but one, while at the same time helping to reduce the communication gap that exists when scientists or extension people develop mass media messages. Because human and financial resources are some of the limiting factors for extension in most developing countries, this would be promising way high quality information in which farmers have an important input themselves.

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Class Interest Against Local Government in Bangladesh

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Abstract

In an age marked by democracy, our failure to ensure decentralization of power, people's participation, accountability, local resource mobilization, bottom up planning and development undoubtedly indicates the presence of a weak, possessive and sluggish local government since local government is the one and only mechanism to produce those things as output. We are inevitably in need of reforming our colonial administration and socio-political system to produce local governance. But reform in all ages all the time was and will be difficult for vested interests of different elite classes in a society. This paper has made an attempt to focus on the causes and nature of antagonism of those classes who stand in the way of establishing a strong and effective local government system in Bangladesh. Finally, it concentrates on the way out of this impasse.

Introduction

The importance of local government can hardly be overemphasized against the backdrop of the increasing difficulties faced by central governments in implementing development programmes and delivering essential services. For years, strengthening local government has been a burning issue treated as one of the preconditions for the success of democracy in Bangladesh. But local government in our country is very weak and by no means can be told effective. Consequently, the government did not reach people and people also did not feel government to be friendly. One of the main reasons that can be attributed to this is the aspiration for clinging to power and selfishness of the elite classes of the society. Some research studies have shown how the entire power in our rural areas is being controlled by a handful of privileged persons by virtue of their advantages in economic power keeping the overwhelming majority of the rural people comfortably away (Kabir, 1978).The Government of the People's Republic of Bangladesh has a constitutional obligation to establish local government to ensure people's participation in the development process. However, in reality, there has been little decentralised governance at the local level. The main responsibility has been entrusted to centralised bureaucracy. Bureaucrats are dead against decentralised administration. They resist the call for reform which goes against their interest. In the past, "attempts to reform local government institutions were of no consequence in practice and all reforms proved futile" (Haque, 1988). Another important impediment is the undue influence of the Members of Parliament (MPs) in the activities of local government. Both ruling and opposition party MPs can not tolerate a powerful chairman in any tier of local government.

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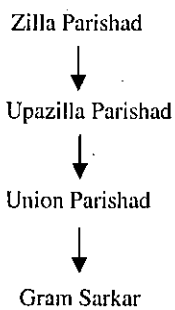
"An unhealthy trend of using local bodies for the narrow political ends of those in power at the national level" is a common phenomenon in Bangladesh (Siddiqui, 1994, P.228). Observation reveals that bureaucrats, MPs and other local power holders belonging to the elite classes of the society are making hindrances in producing people's participation as an output through local government institutions. The major questions to which this paper seeks answer are: What are the interests and outlooks of those elite classes? How do they preserve their interests? Why are they dead against establishing an effective local government system in Bangladesh?

Local Government in Bangladesh and Elite Classes

Before proceeding further, it would be reasonable to focus on the local government of Bangladesh and the meaning of elite class taken in this paper. Considering together the United Nation's definition and the definition given by Duane Lockard, it can be said that local government is a public organization constituted by law and authorized to decide and administer a limited range of public policies within a relatively small territory which is a subdivision of a regional or national government. It has substantial control over local affairs including power to impose taxes or exact labour for prescribed purposes. The governing body of such an entity is elected or otherwise locally elected. From top to bottom, the present structure of local government in Bangladesh and administrative divisions is shown below:

Diagram-1 **Tiers of Local Government in Bangladesh**



Although we have a four tier local government, the third tier is only in effect. These institutions are run by the chairman and members who are locally elected on the basis of adult franchise.

Simply speaking, classifying people or things means to divide according to one or some factors, traits or characteristics such as education, profession, power, quality etc. People belonging to a class must have some common attributes or traits. Social classes with a great deal of power are usually viewed as elites, at least within their own societies. Bureaucrats, MPs, landowners, business elites and rich professionals can be regarded as a class on the ground that they display a common behaviour to gain their vested interests and maintain an interlocking relationship among themselves. This class has been further divided into three other classes based on their distinctive behavioural pattern in order to let the discussion go in its definite course with ease and comprehensibility. These are: i) Bureaucrats ii) Members of Parliament and iii) Local power holders.

Bureaucrats

"The bureaucrats of major interests in the developmental context are generally those who occupy managerial roles, who are in some directive capacity either in central agencies or in the field, who are generally described in the language of public administration as middle or top management. Such an approach will focus on administrative officials who are in a key position to influence public policy" (Ahmed, 1980). This very perspective has been taken in this article.

One of the outstanding features of bureaucracy is that it tends to engulf and dominate an increasing number of social, economic and political activities (Khan, 1984). As a result, the power and influence of the bureaucrat are likely to increase and the very phenomenon which is a legacy from the colonial past is prevailing in Bangladesh. All policy making powers continue to be concentrated at the secretariat. The Rules of Business till recently have given considerable power to the secretary. The end result is that in British an Pakistan period, there was centralised administrative system which we could not change after the independence in 1971 because of the reluctance of the bureaucrats to decentralize the power which they had been exercising from long ago.

In a developing country like Bangladesh, the extent of bureaucratic involvement in politics is exceptionally high (Ahmed, 1980). This is so because parliamentary bodies are not effective enough and extra-bureaucratic political institutions are weak. Much public decision making is performed by the bureaucrats and all decisions are influenced by them (Ahmed, 1980). They enjoy a "functional proximity to the channels of decision making" (Ahmed, 1980). Moreover, they are also tied in an interlocking relationship with the powerful social classes such as the Members of Parliament, landowners, emerging business and industrial elites, rich professionals etc. Under these circumstances, they play a crucial role in determining what will, or perhaps will not, be done. There was and still is no political will and commitment for reforming and overhauling the civil service. The party or the person in power heavily depends on the civil servants to govern and even to retain power. This is why the politicians play a silent role in breaking the deadlock of the civil service system. Even never before have they brought it as an important issue in their election agenda. The civil servants, in return, enthusiastically serve their political masters. Thus, "bureaucrats in Bangladesh, especially those at the higher level, have been remarkably successful in thwarting each and every major effort to reform the public service system" (Khan, 1984).To serve the people is their responsibility. But they avoid having relationship with ordinary people either for maintaining the very nature of aristocracy or for being vainglorious. On the other hand, serving each other's purpose in exchange of interest is a common affair between them and the upper class of the society. Such class interests which are the main dynamics of change in our society are the most important factors in the way of establishing an effective local government system in Bangladesh. Their attitude and outlook do not make us hopeful that they will let the decentralization of power, functions and responsibilities take place and also that they will work or make their orientations development oriented for creating a new social order where justice, accountability, transparency, people's participation will be ensured.

Members of Parliament

The politics of our country has been thrown into the ditch of all nastiness. Political leaders prefer party interest to national interest. MPs (Members of Parliament) elected by the public belong to the elite and rich classes of the society and represent the rich and the business elites in the truest sense. They pay attention to attain their own interest in every possible way by fair means or foul as long as they are in power. They extend their trade by misusing their power and are believed to be engaged in corruption, nepotism, misappropriation of money. As they enjoy the higher facilities and power, they are reluctant to decentralize power and therefore, the effort to establish an effective local government by all means goes against their interest. Their fiery speech about transparency, accountability, rule of law is nothing but a prevarication. So to say, the will and aspiration of the people to establish an effective local government have been being obliterated by the will and aspiration of the political animals to remain as a class enjoying power and the best facilities.

Local Government and Party Politics

Political mobilization affects the operation of local government institutions. Local power holders, especially the chairman and members of the local government institutions, strive to retain their clients and their success in such efforts makes them invaluable to the ruling group (Haque, 1988). The ruling group without a sound political base depends on the support of these leaders to continue in power. Changes in local government institutions are generally geared to achieve such alliances (Haque, 1988). Consequently, we see changes in the structure, composition and function of the local government with the change of party in power. As a result, the institutionalization of the local government has not been yet possible. Sheikh Mujibur Rahman considered the local government under BAKSAL structure as the base of support for the party. Ziaur Rahman seems to have introduced *Gram Sarkar* with an end to extend the political base at the grass root level. Later on, Hussein Muhammad Ershad quashed the *Gram Sarkar* and introduced *Upazilla* system for his own political interest. Likewise, the next government quashed the *Upazilla* system.

Local government becomes involved in national politics because of its not being free from political purposes. Most of the chairmen of the Union *Parishad* are involved in party politics. Their political and ideological relation with the MPs is noticeable. In a research study conducted in 1983 Chairmen are found to pursue MPs for allotting extra assistance under development activities. It was also found that MPs influenced on the Union *Parishad* regarding wheat allotment under Special Project (Food for Works Programme). Such role of MPs gives rise to conflict and friction inside and outside the Union *Parishad* at the local level. MPs press for involving his people in the project committee, which many a time dissatisfies chairmen and members of the Union *Parishad.*

In 2001, a conflict between a Member of Parliament and the chairman of Mogdhara Union *Parishad* reveals the fact that when a proposal for forming a committee was sent to the *Upazilla*

Nirbahi (Executive) Officer on behalf of the chairman, the concerned MP involved some persons of his own choice in the committee by cancelling the name of others who were enlisted in the proposed committee. The chairman rejected this project committee and brought a lawsuit against the MP. Consequently, the activity of the committee was withheld by a verdict of the court. It was not possible to start the activities of the Development Project for this problem in that year. MPs, at the local level, interfere in the institutions including the Union *Parishad* to enhance and strengthen their power base. Thus the independence of the Union *Parishad* is throttled.

Having considered the public opinion, in 2001, at the time of national election, two major political parties of the country in their election manifestos announced their clear commitment to reintroduce *Upazilla* system. In the election manifesto of Bangladesh Nationalist Party (BNP), under the title 'Local Government System' it was cited that for the purpose of the decentralization of administration, *Upazilla* and *Zilla Parishads* would be formed and active initiative would be taken to make the *Parishads* the nerve centre of all the developmental activities through a planned process. On the other hand, in the manifesto of Bangladesh Awami League, under the title "Local Government and People's Empowerment" Awami League made commitment to strengthen the democratic system at grass root level for the decentralization of power and the empowerment of the people. There cited that if Awami League formed the government, they, first off, arranging election at every level including *Upazilla* and *Zilla Parish*ad, would decentralize necessary power and responsibility to locally elected representatives as per the laws already passed and the recommendations of the Local Government Commission.

The new government of four party alliance under the leadership of BNP formed a cabinet committee in order to implement their commitment. By this time, the news under the title 'fervent dispute about the *Upazilla*' appeared in the '*Prothom Alo*' dated 27 February, 2002. It was reported that the government was suffering for indecision. The cabinet committee had been hesitant and divided. One group wished the elected chairman of the *Upazilla Parishad* to lead local development activities and the other group wanted to implement development activities in accordance with the counsel of MP of the concerned area. The last group even opposed the name *Upazilla* and suggested that this tire of local government be introduced as *Thana* Development and Coordination Committee. This group wanted to reduce the importance of the *Upazilla* System so that at the *Upazilla* level, local government, by no menans can be developed. Under these circumstances, the news of the dispute regarding the *Upazilla* system inside the government came to light through newspaper and the academicians again started writing about the pros and cons of the *Upazilla* System. Dr. Masfafi for the hesitation of the government, blame the lobby of jurists working on behalf of the BNP and also said that this lobby in order to obliterate the judicial process from the *Upazilla* level, took initiative to put an end to the entire *Upazilla* system. But The *Upazilla* system, at that time, was still popular, beneficial to the public and developing in the positive sense (The Ittefaq, 2002). Meanwhile, a frustrating news about the commitment of the BNP to implement the *Upazilla* system appeared in a daily. Their commitment to implement the

Upazilla system in the election manifesto was then described as a strategic commitment. Such a statement was farcical and vividly indicates separation from and a deceit with the public.

In our country, it was and is still seen the effort to establish various informal institutions as the step brother beside the formal tires of the local government. For an instance, Relief Committee (1971-1975), *Gram Sarkar* and *Jubo* Complex (1976-82), *Palli Parishad* (1982-90) can be cited. Historically speaking there is not the slightest difficulty in proving that these institutions were created to make supporters and extend party organization so that a new chain of authority could be established at the village level.

Local power holders

The reasons behind discussing other social elites under this class is the need for introducing separately the bureaucrats and the Members of Parliament (MP) because of their distinctive features which affects necessarily, significantly and forcefully the socio-economic and political scenario of a country. In urban areas, basically, landowners, business elites and urban based rich professionals fall under this class. The rural elites in Bangladesh may be classified as follows.

Diagram-2 **Power Elites in Different Bodies**

Power Elites in Formal Bodies	**Sectors of Control**
Chairman and Members of the Union Parishad Government Employees	• Local level administration • Bazar and school committee • Local revenue and law enforcing agencies
Power Elites in Informal Bodies	**Sectors of Control**
Matbar, Jotedar, Headman of the Gushti	• Samaj, Gushti, land allocation after emergence • Economic groupings like various co operatives fertilizer distributor

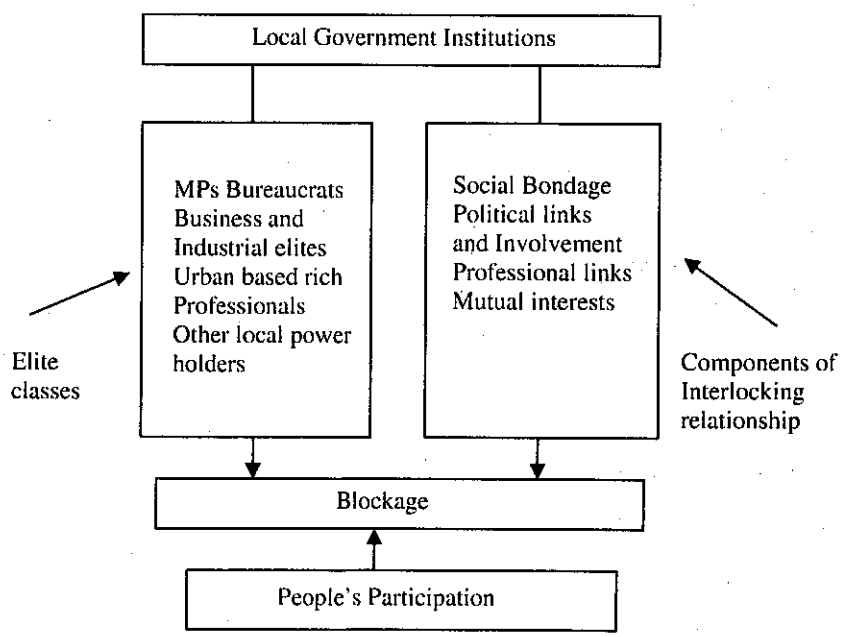
Source: Baqee, 1988, P.42

It is to be noted here that every society possesses certain institutions which determines the positions of the ruling elite or class. Most empirical studies on power structure in Bangladesh clearly point out that all formal and informal institutions worth the name are firmly in the grip of the rural and the urban rich (Siddiqui, 1984). The power elites in rural Bangladesh may be identified as the key persons in the villages with formal and informal positions of vantage. They dominate all spheres of village life through active participation.

Local power holders become firmly established over generations on the basis of family, kinship ties, land and wealth. They almost automatically assume control of local government. People who are exercising control over local communities view any attempt at change as a threat to their dominance. Local government reform is bound to antagonize these leaders as it alters the power

structure of the community and thereby arouses groups or individuals who feel that their interests or power positions will be affected. The rural elites, therefore, make all efforts to prevent power from trickling down to the lowest levels (Haque, 1988). Development Programmes in Bangladesh villages are executed through the formal democratic institutions of the Union *Parishad*. But, ironically, this process favours the interest groups rather than the people at large. The interest groups or elites not only use the Union *Parishad* but also establish contacts with the bureaucracy as an additional means to exercise social control (Baqee, 1998). Since the rich are generally anti-productive, this state of affairs has serious adverse implications for not only equity but also for production, domestic resource mobilization and choice of development strategy. When the local power structure is dominated by land owning elites, people's participation in the execution of any development programme is almost meaningless (Siddiqui, 1984). Studies have documented that resource allocation or any other strategies of rural development can not be carried out because of the local power structure. Most of the candidates who stand for election come from rich and influential family. Local elites bear a greater part of the expenditure for their chosen and potential candidates. These bodies, therefore, serve the purposes of local elites. For example, there are 28 items on which Union *Parishad* can impose taxes. But there is little effort to use taxation power. This is so because these bodies can't let decisions go against the rich and elite classes. The following diagram shows the symbolic presentation of how elite classes restrict people's participation for gaining their interests.

Diagram-3



Experience of Local Government Support Project

The underlying features of this project make us hopeful of a good beginning of an expedition towards good governance. It is a government project, co-funded by World Bank, UNDP, UNCDF, DANIDA and EC, launched in 2001 and ended by the middle of 2007. The purpose of this project was to strengthen Union *Parishads* as accountable, transparent and participatory as possible. Eighty two Union *Parishads* of Sirajgonj District were brought under this project. Its strategy was to provide Union *Parishads* with significantly greater budgetary resources through expanded block grant and supplementary block grant. With this grants, Union *Parishads* were to implement development projects in accordance with agreed procedures. The procedure substantially blocks undue interference of the so called bureaucrats and Members of Parliament. This approach was downward to local citizens who would be able to hold their elective representatives accountable, participate in UP decision-making and know what was going on. Considering the success and fruitfulness of this project, initiatives have already been taken to extend the project throughout the country. The funding system, procedure and working approach to be followed under this project will let the Union *Parishads* go in the right track for achieving self government character in the truest sense. Besides ensuring transparency and accountability, it creates opportunity of people's participation, practice of democracy, female member's empowerment, local development and resource mobilization. Thus, this project is really an object of hope.

Conclusion

Local Government as a political institution to ensure people's participation in government is yet to take a firm footing in Bangladesh (Noor, 1986). Both the British in undivided India and the Pakistani rulers introduced the local government system, only to serve their purpose better (Saqui, 1972). Since independence, (1971) the successive government of Bangladesh have simply twisted the inherited local bodies to suit their political expediency (Noor, 1986). These problems have both political and social dimensions. We are to overcome numerous socio-political and bureaucratic hurdles restricting participation of the masses, especially the poor. These institutions should be free from undue interference of elite classes. At the same time, these institutions cannot be apolitical in nature as "political education of citizens begins here, leadership abilities are developed and nurtured and democracy is facilitated by promoting diversification and deconcentration of political activity" (Siddiqui, 1994). We, therefore, need to translate the demand of the people into strong political commitment. We also need social transformation favourable for local governance.

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Health Scenario of the Char Dwellers of Bangladesh

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Abstract

This paper reveals total health condition of the char dwellers of Bangladesh. The study was conducted on an island char named "Nouhata" under Sirajgonj district. Data were collected through Participatory Rural Appraisal (PRA). People of all age group and sex found to be affected by many diseases, especially women and children are in most vulnerable condition. Most of the women face genital and reproductive tract related diseases, children suffer from diarrhea, dysentery and pneumonia. Fever, flu, dysentery were found most prevailing diseases in this char, with some seasonal diseases e.g. diarrhea, scabies etc. February to July and October to November found to be the most risky period for them. Char dwellers have very small allocation for treatment purpose due to their low income. For treatment purposes they prefer to go to the neighbouring quacks and only for critical cases they go to the Upazilla and District Hospitals in exchange of huge financial cost. They have developed some coping strategies against some most prevailing diseases. About 95% people of the char village are aware about family planning. The villagers are aware about quality of drinking water and about 98% of them drink tube-well water but in case of sanitary latrine, the scenario is poor. Most of the villagers use open field or open latrines for defecation that is why they suffer from diseases like dysentery. Based on the findings, it was realized that the poor people have limited access to the health care services of the Government e.g. Upazilla health complex, District hospitals and awareness programmes on different health issues etc.

Introduction

This study was conducted in both Nothern and Southern parts of Esthol Nouhata, under ward No.9 of Esthol Union, Upazila-Chouhali; District-Sirajgonj. It is an island char. Area of it is around 1533 acres. This char was under water for about 40 years. That means, about second or third generation of the previous inhabitants of this char has already descended and settled here. It was raised in 1987-88, since then people started living here. Thus this char is about 17 years old and char dwellers believe that now this is a stable char and there may be no risk of river erosion for next 20 years.

Like most other chars of Bangladesh this also does not have good communication system with the main land. It takes about one and a half hour by boat across the Jamuna to the nearest main land – Anaetpur-suburb of Sirajganj district head quarter town. Most of the chars of Bangladesh are highly disaster prone, vulnerable and remote.

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Due to remoteness, poverty is prominent there and due to poverty, every aspect of heath e.g. management, doctors, medicine, information, awareness are in a very bad shape. Through this study an attempt was made to sketch the real picture of the char dwellers health scenario. As the char areas of Bangladesh are very vulnerable and disaster prone, the people living here have to face some unusual phenomenal experience with nature throughout their life. Due to uncertainty of most of the disasters they do not have prior preparation. On the other hand, their poverty does not permit treatment of diseases or any other extra expenditure.

Objectives

Broad objective of the study was to depict total health condition of the char dwellers of Bangladesh. Specific objectives were to find out age groups and sexes that are affected mostly by different diseases. It was also necessary to explore their treatment process. Gathering knowledge about the local coping strategies developed by the char dweller were also important to identify for taking better initiatives during disasters and to make effective health policies for them.

Methodology

Collection of data about a fact at real situation and time is important and helps researchers to get actual information. Based on this philosophy, the village was visited for three times to cover major seasons described by the char dwellers. PRA was used to collect data about health and nutrition of the people of Nouhata. Body mapping was used to identify the most prevailing diseases and age groups and sexes that are affected mostly by different diseases. To rank those identified diseases, disease ranking was conducted to get a view of nature and occurrence frequency of diseases. Through seasonality of disease, the spreading time of diseases were identified. Mobility mapping describes their access to the treatment centers and doctors. Strategies for disease management were revealed through group discussion. Case study and interviews were also conducted to get additional, accurate information and for cross checking. Pie diagram of expenditure reveals their money allocation for treatment and so the importance of disease to them. All these data were collected with a view to find out effect of different seasons on their overall health condition.

Results and Discussion

Some times we have to come back home from hospital and wait for death to come as we don't have enough money for treatment.

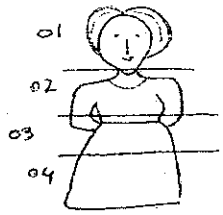
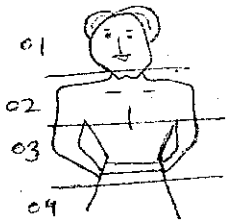
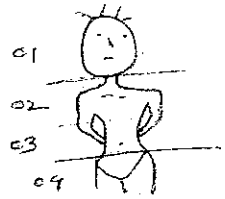
-An old man of North Nouhata

The above quotation expresses and describes the real scenario of health of this village.

Body mapping

It was tried to know the major diseases affecting people of different sexes and age groups. For this reason, this session was conducted in both parts of Nouhata (Fig: 01). It was found that the women suffer mostly from genital and reproductive tract related diseases. In most of the cases, their disease goes to critical conditions because they usually do not discuss about it with other persons or even with their husbands.

Fig 01: Body Maping

Part of Body	Women	Men	Children
			
Head and neck (01)	Tonsillitis (tonsil), Head ache.	Head ache (matha batha) Whitening of hair (chul paka), Eye sight problem, Cough, Dental Cavity, Tonsillitis (tonsil), brain problem.	Ear infection (kan paka), Head ache (matha batha), conjunctivitis (chokh otha), sneezing and coughing, tongue and mouth infection, night blindness.
Chest (02)	Asthma (buke chap) Jaundice (jaundice shet or mata).	Jaundice (jaundice shet or mata), Paralysis, Pneumonia (buke chap), Chest pain, stroke, Scabies (chulkani), Bronchitis (jakha), Skin disease.	Throat pain, chest pain, asthma, pneumonia.
Belly (03)	Dysentery (amasha), Indigestion (hazomer gandogol), Diarrhea (Patla paikhana), Pain in lower abdomen, Diabetes.	Dysentery (amasha), Indigestion (hazomer gandogol), Diarrhea (Patla paikhana), ulser, appendicitis.	Dysentery (amasha) Indigestion (hazomer gandogol) Diarrhea (Patla paikhana), stomach pain, warm, scabies.
Lower Part (04)	Piles (Buti), Menstrual problem, Abortion, Inflammation. Problems of Reproductive tract: Sada cham, Uterus comes out, Scabies, Infection, Problems of Urinary tract: Increased frequency of Urination, Inflammation, have pressure of Urine but can not Urinate.	Urination problem, Rheumatoid.	Scabies, Hydrosyl.

Prepared by: Rezia, Hasna, Hazera, Bakshi, Rozzi, Majnila

Facilitated by: Mizan and Dil afroz

When situation becomes unbearable they discuss it with their female neighbour and husband and try to take some conventional medicine from quacks. This makes the diseases chronic. Children suffer from some infection in mouth, tongue and eye. The disease which is very common and dangerous to children is found pneumonia. Many infants die of this disease. Jaundice and heart disease are prominent in males. Dysentery and diarrhea are common and mostly found disease in children, male and female members of this village.

Disease Ranking in Nouhata

It was also important to rank the diseases according to their intensity of occurrence. Disease ranking is shown in Fig: 02 and Fig: 03. Here, one thing is very interesting: the villagers ranked diarrhea at number 3 and 7. As justification, they told us that diarrhea is most dangerous disease especially for children. Within a short time patient dies. That is why, they remain careful about it. Earlier intensity of this disease was high, now they do some practice to get rid of this deadly disease. They keep their food covered, so that flies can not infect their food with micro organism responsible for diarrhea. They try to avoid eating rotten food. According to them, dysentery is the most disturbing disease. Then fever and flu affect them mostly. Older people suffer from rheumatoid more or less round the year. Diarrhea is not common but dysentery is the first disease to disturb them most. This implies that they have knowledge about the precautions of diarrhea and dysentery but can not practise these all the time because most of them do not have sanitary latrine. Open space defecation and *katcha* latrine are good sources of causal agents of diarrhea and dysentery and help their easy transmission.

Seasonality of Disease Occurrence in Nouhata

This session was conducted to know about the most prevailing diseases in Nouhata. Through this tool complete and well organized data regarding impact of different seasons on disease development of that area were gathered (Fig: 05 and Fig: 06). Some diseases were found to be related to the natural disasters and some with poverty, illiteracy.

- **Fever:** occurs more or less round the year but intensity is high in the month of February, March, April, May, August, September, October and mid-November . Fever is prominent when flood water runs out and in May-June because of new cold flood water.
- **Dysentery:** breaks out mostly in March, April and May and of course when flood water persists for long time.
- **Flu or cold:** frequency of occurrence of flu is high in the months of December-March because of winter season. During flood, new cold water comes in the months of June to October and causes flu.
- **Diarrhea:** intensity of this disease increases from August to November.
- **Rheumatoid:** prevails more or less round the year. But its intensity is less from the month of September to December. They think it is related to the augmentation and decline of the moon size. They used a term "Joaire din" referring to increase of the disease during flood.
- **Measles and chicken pox:** increase in February, March and April due to dry weather.
- **Scabies:** in February-March, intensity of this disease is high.

Fig 02: Disease Ranking of South Nouhata

Disease	Rank
Rheumatoid	8
Chicken pox	4
Measles	6
Dysentery	1
Flu	3
Fever	2
Diarrhea	7
Scabies	5

Prepared by:
Sabur, Sam mondal, Rezaul, Hasem, Harez, Baksho, Razzak, Majnu Mondal

Facilitated by: Mizan and Dil afroz

Fig 03: Disease Ranking of North Nouhata

Disease	Rank
Dysentery	5
Diarrhea	3
Flu	2
Ulcer	7
Fever	1
Measles	4
Chicken pox	6
Uterine problems	8

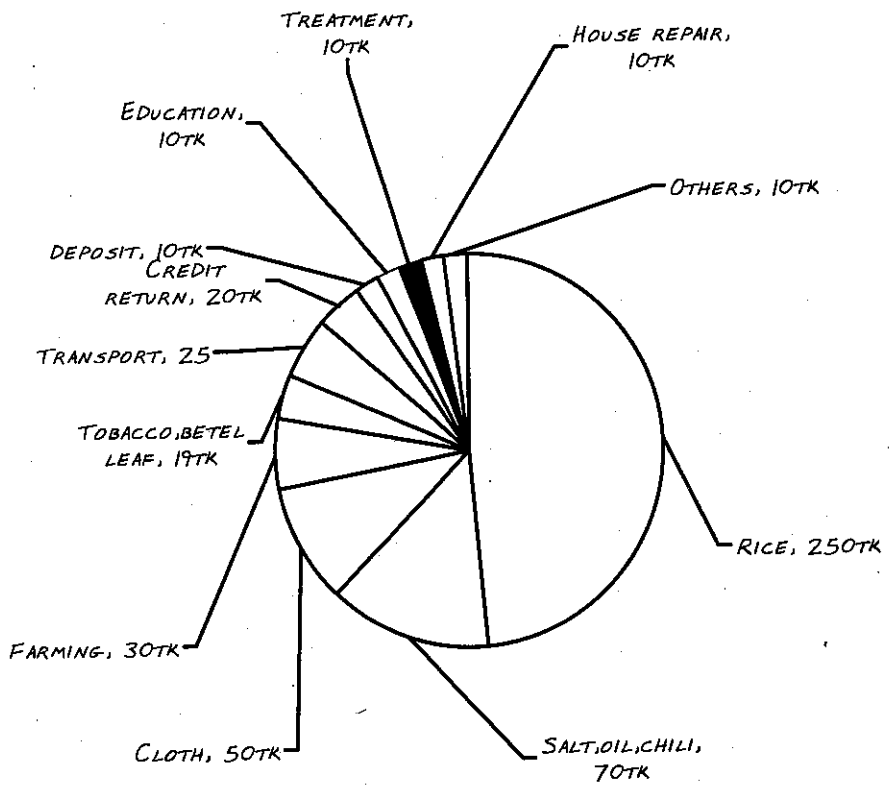
Prepared by:
Goljar Mondal, Khalek, Abdul Rahim, Hafiz, Bayan, Aynal, Joynal, Gafur Fakir

Facilitated by: Mizan and Dil afroz

Amount of Money Spent For Health Care

Data were collected on the weekly expenditure of the villagers (Fig: 04). From the following pie diagram it can be easily understood the picture of their health consciousness. They spend about **2%** of their weekly income for health care purpose. It does not mean that they suffer less from diseases. Ironically, it means that they are careless and always try to ignore the health related problems as access for them to health institutions is expensive and not easy.

FIGURE- 04: PIE DIAGRAM OF EXPENDITURE IN SOUTH NOUHATA



Facilitated by: Mizan and Dil afroz

Prepared by:
Toazzal Bodi Salam
Merjan Idris Kismat

Fig 05: Prevalence of diseases during different months (Seasonality) in North Nouhata

Disease	Apr-May (বৈ)	May-Jun (জৈ)	Jun-Jul (আ)	Jul-Aug (শ্রা)	Aug-Sep (ভা)	Sep-Oct (আশ)	Oct-Nov (কা)	Nov-Dec (অ)	Dec-Jan (পৌ)	Jan-Feb (মা)	Feb-Mar (ফা)	Mar-Apr (চৈ)
Fever		√			√	√	√				√	√
Diarrhea					√	√	√					
Dysentery	√											√
Flu			√	√	√	√			√	√	√	
Rheumatoid	√	√	√	√	√						√	√
Chicken pox											√	√
Measles											√	√
Scabies											√	

Prepared by:
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Facilitated by: Mizan and Dil afroz

Fig 06: Prevalence of diseases during different months (Seasonality) in South Nouhata

Disease	Apr-May (বৈ)	May-Jun (জৈ)	Jun-Jul (আ)	Jul-Aug (শ্রা)	Aug-Sep (ভা)	Sep-Oct (আশ)	Oct-Nov (কা)	Nov-Dec (অ)	Dec-Jan (পৌ)	Jan-Feb (মা)	Feb-Mar (ফা)	Mar-Apr (চৈ)
Fever	√	√										
Diarrhea			√				√					
Dysentery								√	√		√	√
Flu		√	√						√			
Chicken pox											√	√
Measles											√	
Ulcer	√	√	√	√	√	√	√	√	√	√	√	√
Uterine problem	√	√	√	√	√	√	√	√	√	√	√	√

Prepared by:
Sabur, Sam mondal, Rezaul, Nasem, Harez, Baksho, Razzak, Majnu Monda

Facilitated by: Mizan and Dil afroz

Mobility Map of North Nouhat

This session was conducted to identify the access places for the villagers regarding health issues. In the following figure (Fig: 07) arrow of different length and width are used. Here, similar width means with the same frequency they visit places and length represents distance of that place from Nouhata. Frequency of visit and distance increases with the increase of width and length of the arrows.

Firstly, they prefer to go to Asan munshi, imam of North noahata mosque for conventional treatment like *jhar-fhuk*[2], *tabiz*[3], *telpora*[4] and *pani pora*[5].

Secondly, when this *jhar-fhuk* doesn't work they go to Anaetpur. Anaetpur is 5 miles away from Nouhata, they have to go by boat there. Doctors and medicine shops are available there and they buy medicine after consultation with the doctors. Some times they prefer consultation directly with medicine shopkeepers for minor diseases. They don't go to Upazilla sadar hospital because of long distance and doctors claim undue money from them.

Thirdly, when situation get worse they have to go to Sirajganj which is 20 miles away from Nouhata. In most of the complex cases like operation they go to Sirajganj. They use firstly boat then bus to go there.

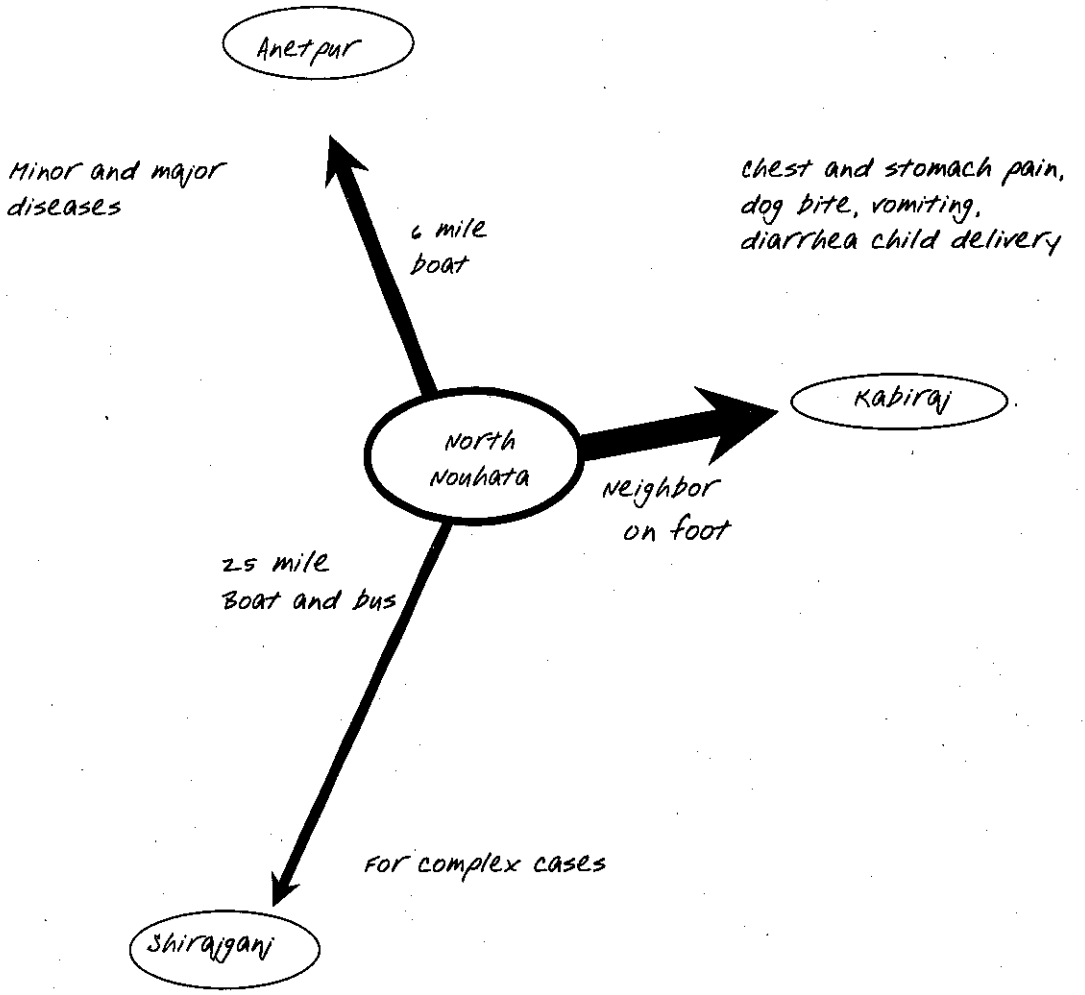
For most of the cases they consult with medicine shop keeper about the problem and ask him to prescribe some medicine and it is a very common practice.

Case: Hafiza Bewa

My name is Hafiza Bewa, I am 55 years old. 30 years ago my husband Nia ullah and one of my sons died in a boat accident. Since then I am passing my days with my other son in a great misery. I am renowned *dai* of this vicinity and doing my job since my 30 years of age. I have helped many women to deliver their children, including twins and dislocated children. When situation gets complex incase of a pregnant mother, I refer the patient to hospital. Still now, I have no record of child death; that's why people rely on me. Seven years ago I got training from MMS. From this training, I learned about many modern techniques and precautions of my profession.
I also give treatment of snake bite, complexity of mothers after child birth, fever, stomach pain etc.
I think people of Nouhata are very lucky to have such neighbour like me who can help them a lot in their need.

Figure- 07: The places where people of North Nouhata go for treatment

(Frequency of visit and distance increases with the increase of width and length of the arrows)



Prepared by:
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Facilitated by:
Mizan and Dil afroz

Mobility Map of South Nouhata

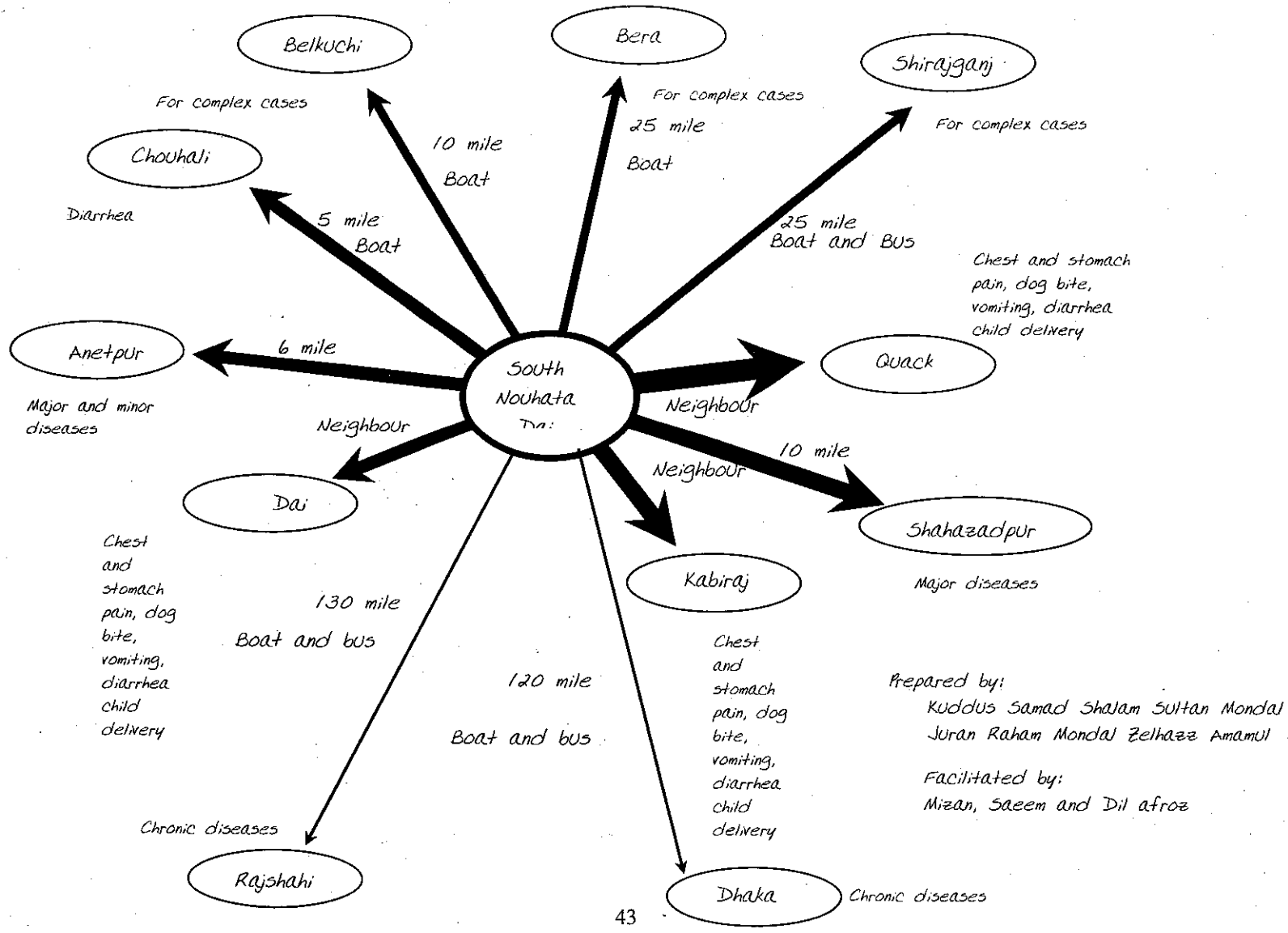
In this map (Fig: 08), arrows of different length and width mean the same meaning as above. People of South Nouhata go several places for health services. Most of them are as follows:

- **Midwife (*Dai*), quack, *kabiraz*:** for 70% cases, the villagers go to these persons for treatment. Most of them are the inhabitants of their own village; that is why they can easily get them even at night. Most of them do not claim money also. They go to *kabiraz* for the treatment of diseases like chest and stomach pain, dog bite, vomiting and diarrhea. For child delivery of pregnant women they always go to *dai* or midwives, not to the doctors. There are seven midwives in this village; four of them are trained by MMS.
- **Dhaka and Rajshahi:** in severe cases like cancer, when doctors refer; they go to Dhaka. Dhaka and Rajshahi are about 120 miles and 130 miles away, respectively from Nouhata and they have to use boat and bus as transportation means. To get treatment from these places, they have to pay so much that only rich people can afford to go there. If poor people suffer from diseases for which they have to go to Dhaka or Rajshahi they come back home and wait for death, because they do not have any asset or money by which they can continue the treatment.
- **Sirajganj:** is 25 miles away and people go there for complex cases. They go to Belkuchi (10 miles away) and Bera (12 miles away) for the same purposes.
- **Anaetpur:** is 6 miles away. Recently a big modern medical college has been established there but treatment is very expensive.
- **Shahazadpur:** is 10 miles away from Nouhata. There is public hospital in Shahazadpur. But they do not go there because of wrong and ill treatment; they usually go to private clinics for better treatment.
- **Chouhali:** 5 miles away, diarrhea patients usually go to MMS office for treatment.

Improvement in Disease Management

One thing we have noticed in this village is that people **at present** are suffering less from common diseases like diarrhea. According to them, now they know what the causes of these diseases are and how to keep themselves free from them by adopting some disease management techniques. For this awareness credit goes to media for intensive broadcasting of effective programmes related to these issues, CLP (Chars Livelihoods Programme) and other NGOs as well. The villagers now adopt the following techniques:

- Now they are more conscious and careful
- Got training
- Always cover food
- Drink tube-well water
- Do not eat rotten food
- During the month of September-November (Aswin and Kartic) they take less amount of food because they think if they eat more there is a risk of sickness. It may be a local invention.


Belkuchi
For complex cases
10 mile
Boat
Bera
For complex cases
25 mile
Boat
Shirajganj
For complex cases
Chouhali
Diarrhea
5 mile
Boat
25 mile
Boat and BUS
Chest and stomach pain, dog bite, vomiting, diarrhea child delivery
Anetpur
Major and minor diseases
6 mile
South Nouhata
Quack
Neighbour
Neighbour
Neighbour
10 mile
Dai
Chest and stomach pain, dog bite, vomiting, diarrhea child delivery
Shahazadpur
Major diseases
Kabiraj
Chest and stomach pain, dog bite, vomiting, diarrhea child delivery
130 mile
Boat and bus
120 mile
Boat and bus
Chronic diseases
Rajshahi
Dhaka
Chronic diseases
Prepared by:
Kuddus Samad Shalam Sultan Mondal
Juran Raham Mondal Zelhazz Amamul
Facilitated by:
Mizan, Saeem and Dil afroz

Family Planning

It was discovered that most of the families have more than three children. We tried to get a picture of family planning situation prevailing in Nouhata. Both men and women of North and South Nouhata discussed with us about their family planning (FP) concept and practice of different FP methods.

It was found that, more or less, all the villagers knew about family planning. People of North Nouhata are a bit more knowledgeable and conscious about FP. Mostly women are practising and encouraged by their husbands to adopt FP. There is confusion among them both from methodological and religious perspective regarding some FP methods. They have developed such knowledge from MMS (Manob Mukti Sangshtha) and recently from CLP training. Keeping in mind that these discussions should be very personal/private, if it becomes possible to give them proper knowledge in proper way, they will show positive approach toward family planning. Intensive motivational work is needed to make FP more popular and effective in the char areas. The villagers are already realizing the importance of FP in their life. According to them having many children creates many problems like the following:

- Increased scarcity in family.
- Parents can not provide food and cloathes to many of their children.
- Cannot afford education costs.
- Bad effect on mother's health.
- Parents can not take proper care of their children.
- Not possible to ensure proper hygiene of children.
- Children get affected of malnutrition.
- Increase intensity of disease.
- Can not teach them how to use toilet, they usually defecate in the open space.
- Some times, it becomes impossible to provide education to all children properly and alike.

Sanitation and safe drinking water

Above 95% family use safe drinking water that is tube-well water. During flood they collect water from those tube-wells which are not submerged. They search and try to find these tube-wells by boat but never drink flood water.

Conclusion

Hardship and poverty are very prominent in the char areas of Bangladesh. Lack of medical centres, doctors, communication facilities with the lowest local Government unit–Union Parishod (UP), devious attitude of the UP chairmen and members and of course, poor road and transport system horrify the heath care situation in the chars. During off–season or less income period they do not care for minor diseases. If it becomes worse they have to wait for better time or to borrow

money at a very higher rate of interest. Like most of the villages, diarrhea is not a deadly disease here because they do some practice to get rid of this lethal disease. This implies that they have developed some coping strategies against diarrhea and dysentery. Sanitary latrines were merely seen in this village but most of the families have building materials of latrine but do not build it due to their discomfort and lack of awareness. Char dwellers prefer open space defecation which is one of the main reasons for spreading of these diseases. Motivation can help them to be encouraged to build low cost sanitary latrine or latrine materials can be supplied to them to ensure a sound health condition. Above 95% family use safe drinking water that is tube-well water. Even in flood they try to collect safe drinking water but never drink flood water. Skin diseases like scabies and fungal diseases increase during flood. Their knowledge and interest in family planning is really impressive, more than 90% men and women are adopting different family planning techniques. February to July and October to November are the most perilous period according to the inhabitants because most of the diseases occur during these months. As like as, other part of Bangladesh inhabitants of the char suffers from the common diseases but they have to face some unusual events e.g. flood, drought, river erosion etc. of nature round the year. These cause them extra cost for treatment and have a very adverse effect on their income. Most of the villagers are day labourer, if head of the family becomes sick, it affects the whole family. Usually they do not have enough money to support their family for more than one or two days. In case of serious illness they need to borrow money at a very high interest for their treatment. They have a strong struggling attitude to cope any kind of problem. Though there are a lot of limitations from the part of Government it was found that the health situation could be upgraded by some motivational work and very little effort from the Government health services. Development of communication with the main land could change a major portion of this scenario. This study would help policy makers to find out when, how and on which health issues they need to concentrate.

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Effects of Plant Extracts on Incidence of Anthracnose Disease, Yield and Quality of Mango

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Abstract

An experiment was carried out for controlling mango anthracnose disease and achieving higher yield and quality of mango cv. Amrapali at the Germplasm Centre of the Fruit Tree Improvement Project (GPC-FTIP), Department of Horticulture, Bangladesh AgriculturalUniversity, Mymensingh during the period from July 2000 to July 2001. The experiment was conducted to investigate the effect of different plant extract on incidence of anthracnose, yield and quality of mango. The results revealed that Garlic extract with three times application (Before emergence + After emergence + After fruit sets) gave the highest fruit set, fruit retention, fresh fruits therefore, produced the highest yield per plant and per hectare than control.

Introduction

In Bangladesh in terms of total area and production of fruit crops, mango (*Mangifera indica* L) ranks first in area and third in production. It occupies 50990 hectares of land with a total production of 242605 tons per annum and an average yield of 4.75 tons per hectare (BBS, 2005). But the yield of mango in Bangladesh is very low compared to India, Pakistan and many other mango growing countries in the world (Hossain and Ahmed, 1994). The most common disease of mango is anthracnose caused by *Colletotrichum gloeosporioides.* The harmful effect of the fungicide is responsible for air, soil and water pollution (Alam, 1987) and causes serious health hazards. More over indiscriminate use of chemicals disrupt the natural ecological balance by killing the beneficial and antagonistic soil microbes. Chemicals in controlling plant pathogens are being discouraging all over the world. Therefore, the present research program was conducted to identify suitable plant extract for controlling mango anthracnose and thereby increase yield and quality of mango per unit area and also reduce cost of mango production.

Materials and Methods

The investigation was carried out from July 2000 - July 2001 at Germplasm Centre at Bangladesh Agricultural University (BAU), Mymensingh. The single-factor experiment was conducted in randomized complete block design (RCBD) with 3 replications. The treatments were Garlic extract (T_1); *Neem* extract (T_2); *Biskatli* extract (T_3); *Pithraj* extract (T_4) and Control (T_5) having a

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total number of 15 plants. The variety was Amrapali and spacing was 2.5m x 2.5m. The plants were irrigated, weeded and fertilized regularly as recommended in fertilizer recommendation guide (BARC, 1997). The recorded parameters were fruit retention per inflorescence and per plant (%); total number of healthy fruits per inflorescence and per plant (%); total number of diseased fruits per inflorescence and per plant (%); total number of diseased fruits per inflorescence and per plant (%); disease incidence (%);surface area (%) infected per fruit; fruit weight (g), fruit size (cm) yield/plant; yield (t/ha) and total soluble solids (TSS). The benefit-cost ratio (BCR) analysis was also calculated.

Preparation of Plant Extracts: Different plant species were collected from different places around BAU campus. Ten gram (10g) of each sample was taken in an electric blender and 100 ml distilled water was added. Therefore the concentration was raised to 1:10. The content was macerated and a suspension was prepared. The suspension was then filtered through cheese cloth. The clean suspension filtrate at the bottom was used as spray suspension. The name of the different plant parts are Garlic *(Allium sativum), Bishkatali (Polygonum hydropiper), Neem (Azadirachta indica) and Pithraj (Azadirachta richordiana).* The suspension of different plant extracts was sprayed individually by hand sprayer. First spray was done before emergence of inflorescence, second spray after emergence and third was done after fruit set. All exposed surface of the plants including leaves, buds, twigs, flowers, fruits and branches were sprayed. Control plants were sprayed with water at the same time.

Results and Discussion

Fruit set per inflorescence was found to be significant due to different treatments (Table 1). The highest (14.87) fruit set per inflorescence was obtained from Garlic and the lowest (7.23) was found in the Control. Fruit retention per inflorescence at different days after fruit set (DAFS) was significantly influenced by different plant extracts (Table 1). The highest (2.47) number of fruits retention was recorded from Garlic extract followed by *Bishkatali* (1.93) and *Neem* extract (1.53) at 60 DAFS and the lowest (1.00) was observed in the plants having no extract sprayed. Fruit retention per plant varied significantly due to the effect of different plant extracts. Fruit retention per plant showed same trend as that of fruit retention per inflorescence (Table 1).

There are few literature available on the effect of plant extract related to anthracnose disease. However, this result is supported by the reports of Chauhan and Joshi (1990) who stated that Garlic extract and *Bishkatali* extract reduced the disease incidence of fruits. Number of healthy fruits per inflorescence as influenced by different plant extracts is shown in Table 2. Number of healthy fruits per inflorescence did vary from time to time in different treatments at different DAFS. The highest (2.20) number of healthy fruits per inflorescence was recorded from Garlic extract spray followed by *Bishkatali* (1.77) and *Neem* extract spray (1.32) and the lowest (0.84) was found in Control plant at 60 DAFS.

Table- 1: Effect of Plant Extract on Fruit Set and Fruit Retention of Mango

Treatments	FS/I	Fruit retention/inflorescence at different DAFS						Fruit retention/plant (%) at different DAFS					
		10	20	30	40	50	60	10	20	30	40	50	60
Garlic extract	14.87	9.13	6.20	4.40	3.20	2.53	.47	1.67	44.67	31.00	21.33	19.33	19.00
Neem extract	8.73	6.27	3.20	2.20	1.53	1.53	1.53	71.33	36.67	25.00	17.33	17.33	17.33
Bishkatali extract	10.53	8.00	4.00	3.13	2.13	2.07	1.93	75.33	38.33	30.00	19.67	19.33	18.33
Pithraj extract	7.53	4.60	2.67	1.47	1.40	1.40	1.40	60.00	35.33	19.67	18.33	18.33	18.33
Control	7.23	4.33	2.33	1.40	1.07	1.07	1.00	58.33	33.67	19.33	15.00	15.00	14.00
LSD 5%	0.77	1.01	0.67	0.42	0.38	0.45	0.41	4.11	3.77	2.21	2.20	2.50	2.38
1%	1.73	1.59	0.97	0.61	0.54	0.65	0.59	5.98	4.90	3.22	3.20	3.64	3.47
Level of Significance	**	**	**	**	**	**	**	**	**	**	**	**	**

FS/I = ***Fruit set/Inflorescence at the initial stage*** ** = ***Significant at 1% level***

DAFS = ***Days after fruit set*** * = ***Significant at 5% level***

Number of healthy fruits per plant at various DAFS was found significantly higher in Garlic treated plant than that of control. Garlic extract gave the highest (89.07%) number of healthy fruits per plant and the lowest (84%) was found in control plant at 60 DAFS (Table 2).

Table- 2: Effect of Plant Extract on Disease Incidence of Mango Anthracnose

Treatments	No. of healthy fruits/Inflorescence at different DAFS			No. of healthy fruits/plant (%) different DAFS			No. of diseased fruits/Inflorescence at different DAFS			No. of diseased fruits/plant (%) at different DAFS		
	40	50	60	40	50	60	40	50	60	40	50	60
Gerlic extract	2.90	2.28	2.20	90.62	90.12	89.07	0.30	0.25	0.27	9.38	9.88	10.93
Neem extract	1.34	1.32	1.32	87.58	86.27	86.27	0.19	0.21	0.21	12.42	13.73	13.73
Bishkatali extract	1.94	1.81	1.77	89.20	87.44	87.00	0.23	0.26	0.27	10.80	12.56	13.00
Pithraj extract	1.20	1.20	1.19	85.71	85.71	85.00	0.20	0.20	0.21	14.29	14.29	15.00
Control	0.91	0.92	0.84	85.05	85.80	84.00	0.16	0.15	0.16	14.95	14.20	16.00
LSD 5%	0.22	0.27	0.17	2.31	0.21	3.07	0.06	0.02	0.02	1.33	1.67	3.58
1%	0.32	0.40	0.25	3.36	0.30	4.46	0.09	0.03	0.03	1.93	2.43	2.46
Level of Significance	**	**	**	**	**	**	**	**	**	**	**	*

FS/I = ***Fruit set/Inflorescence at the initial stage*** ** = ***Significant at 1% level***

DAFS = ***Days after fruit set*** * = ***Significant at 5% level***

Number of diseased fruits per inflorescence showing significant effect by different treatments is presented in Table 2. The maximum (0.30) number of diseased fruits per inflorescence was observed in Garlic and the minimum (0.16) was found in Control at 40 DAFS. Higher number of diseased fruits per plant was found in Control compared to Garlic treated plants (Table 2). Number of diseased fruits per plant in most of the treatments was higher than in Garlic treated plants at different DAFS. At 60 DAFS, the highest (16%) number of diseased fruits per plant was recorded from Control plants and the lowest (10.93%) from Garlic treated plants followed by *Bishkatali* (13%) and *Neem* (13.73%) at 60 DAFS. At harvest there was significant difference in the total number of fruits per plant among different plant extracts (Table 3). Maximum (53.67) number of fruits per plant was found in Garlic treated plant followed by *Bishkatali* (47.00), Neem (39.00) and *Pithraj* (37.00) while, minimum (27.00) number was recorded from untreated plants. Weight of individual fruit was also influenced by different treatments. The highest (190 g) weight of individual fruit was observed in Control plants and the lowest (173.33 g) from Garlic treated plant (Table 3).

Table-3: Effect of Plant Extract on Yield and Quality of Mango

Treatments	TNF/ plant	Wt. of individual fruit (g)	TNHF/plant		TNDF/plant		Healthy fruits yield/ plant (Kg)	Healthy fruits yield (t/ha)	TSS	BCR
			No.	%	No.	%				
Garlic extract	53.67	173.33	48.33	91.67	4.33	8.33	7.34	11.74	28.00	2.82
Neem extract	39.00	187.67	34.67	89.00	4.67	11.00	5.27	8.43	27.00	2.48
Bishkatali extract	47.00	179.00	43.00	91.00	4.00	9.00	5.80	9.28	26.0	2.73
Pithraj extract	37.00	174.33	32.00	86.33	5.00	13.67	4.55	7.28	24.00	1.85
Control	27.00	190.00	23.00	85.00	4.00	15.00	3.60	5.76	23.00	1.82
LSD 5%	5.50	4.39	4.52	2.99	0.64	2.87	0.75	1.15	2.50	-
1%	8.00	6.39	6.58	4.35	0.94	4.17	1.09	2.20	3.64	-
Level of significance	**	**	**	**	*	**	**	**	*	-

DAFS = *Days after fruit set*
TNF = *Total no. of fruits*
TNHF = *Total no. of Healthy fruits*
TNDF = *Total no. of diseased fruits*
TSS = *Total Soluble Solid*
BCR = *Gross return / Total cost of production*
* = *Significant at 5% level*
** = *Significant at 1% level*
NS = *Not significant*
Spacing = *2.5m X 2.5m*
BCR = *Benefit Cost Ratio*
Note: *Price of mango was considered to be TK 20/kg*

This was possibly due to higher yield per plant in Garlic and *Bishkatali* treated plants than the Control ones, which led to lower individual fruit weight. Garlic extract and *Bishkatali* extract almost gave the highest number of healthy fruits per inflorescence and per plant than the Control treated plants at different DAFS. This might be due to reduction of fruit infection by Garlic and *Bishkatali* extracts. Therefore, the plants under these treatments produced the highest number of healthy fruits per inflorescence as well as per plant. Bisht and Khulbe (1995) have demonstrated

similar results. They stated that Garlic extract have antifungal activity and prohibit the mycelial growth of the fungus. Ashrafuzzaman and Hossain (1992) also found that plant extract of *Biskatali* (*Polygonum hydropiper*) inhibited the mycelial growth and spore germination effectively against *Rhizoctonia sonali.*

Different plant extracts significantly influenced on total number of healthy fruits. Among the different plant extracts, Garlic extract gave the highest (48.33) number of healthy fruits followed by *Bishkatali* (43.00), Neem (34.67) and *Pithraj* (32.00) and the lowest (23.00) from Control plants. The highest percentage (91.67) of healthy fruits per plant was recorded from Garlic extract treated plants followed by *Bishkatali* (91%), *Neem* (89%) and *Pithraj* (86.33%) and the lowest (85%) was recorded from Control plants (Table 3). These results might be due to inhibition of the fruit infection by plant extracts. Therefore, number and percentage of healthy fruits per plant were found higher. These results are close to Ahmed and Islam (2000) who stated that Garlic and *Neem* extracts were effective against the disease of Brown spot (*Bipolaris oryzae)* of rice. Among the different plant extracts, control plant gave the lowest (4.00 out of 27 fruits) number of diseased fruits followed by *Bishkatali* (4.00 out of 47 fruits) and Garlic (4.33 out of 53..67 fruits) and the highest (5.00 out of 37.00 fruits) number of diseased fruits per plant was found in *Pithraj.* Percentage of diseased fruits per plant varied significantly due to different plant extracts. The highest (15) percentage of diseased fruits per plant was found in Control treated plants followed by *Pithraj* extract (13.67%), *Neem* extract (11.00) and *Bishkatali* extract (9%) and the lowest (8.33%) from Garlic treated plants. Different plant extracts decreased the intensity of infection on fruits. Garlic and *Bishkatali* extracts significantly reduced fruit infection. Therefore, the plants produced the less number of diseased fruits per inflorescence and per plant. This results is close to Bisht and Khulbe (1995) who stated that *Allium sativum* have antifungal properties and significantly reduced mycelial growth of *D. oryzae* which led to the reduction of fruit infection. Healthy fruits yield per hectare of different plant extract also showed highly significant variation (Table 3). Among the different plant extracts, the highest (11.74 t/ha) yield was obtained from Garlic extract followed by *Bishkatali* (9.28 t/ha), Neem (8.43 t/ha) and *Pithraj* (7.28 t/ha) and the lowest (5.76 t/ha) from Control treated plants. This may be due to the fact that Garlic and *Bishkatali* treated plants gave the highest number of healthy fruits per plant, which led to the highest yield per hectare. There was significant difference in total soluble solids by different plant extracts (Table 3). The highest (28.00) soluble solid was obtained form Garlic extract followed by *Neem* extract (27.00), *Bishkatali* extract (26.00) and *Pithraj* extract (24.00) and the lowest (23.00) from control treated plants. The disease incidence was low incase of garlic treated fruits than control which led to the given the higher TSS in garlic treated fruits. The highest (2.82) BCR was obtained from Garlic extract and the lowest (1.82) was obtained from control plant (Table 3). It was due to the fact that this treatment gave the highest yield, which led to the highest return.

After harvest ten healthy fruits were selected randomly from each treatment for post harvest study. Disease incidence was calculated at 6, 8 and 10 days after harvest. Disease incidence of anthracnose as influenced by different plant extracts is presented in Table 4.

Table- 4: Effect of Plant Extract on Disease Incidence and Severity of Mango

Treatments	Incidence (%) at DAH			Severity/ FAD (%) at DAH		
	6	8	10	6	8	10
Gerlic extract	0.00	10.00	13.33	0.00	0.00	0.67
Neem extract	16.67	33.33	40.00	0.33	0.67	1.67
Bishkatali extract	10.00	26.67	30.00	0.00	0.33	1.33
Pithraj extract	26.67	33.33	53.33	0.33	0.67	2.00
Control	30.00	43.33	60.00	0.67	1.33	3.20
LSD 5%	5.31	3.91	6.46	0.08	0.29	0.83
1%	7.79	5.72	9.40	0.12	0.42	1.20
Level of significance	**	**	**	**	**	**

DAH = *Days after harvest* ** = *Significant at 1% level*
FAD = *Fruit area diseased*

The highest (60%) incidence was found in control treated fruits followed by *Pithraj* (53.33) and the lowest (13.33%) from Garlic treated fruits at 10 days after harvest. Fruit area diseased at different days after harvest (DAH) as influenced by different plant extracts is shown in Table 5. The maximum (3.20%) fruit area diseased was found in control plant. Minimum (0.67) fruit area diseased was observed in Garlic. This result was found due to the application of Garlic extract, which reduced the fruit infection. Therefore, disease incidence and severity was lower in Garlic than the Control treatment.

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Effect of Cooking and Refrigeration on Vitamin-C Contents of Pea, Bean and Tomato

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Abstract

This study was undertaken in 2003 to determine the effect of conventional cooking and refrigeration on vitamin C contents of pea, bean and tomato. Vitamin C contents of the vegetables were determined after certain time intervals (3 min., 6 min., 9 min., and 12 min in case of cooking at 100° C and 1 day, 3 days, 5 days, 7days, 9days and 11 days in case of refrigeration at 6° C). The data were analyzed using regression equation and semi-log coordinate. It was revealed that vitamin C losses during conventional cooking were the highest for tomato followed by pea and bean. On the other hand, vitamin C losses were the highest for bean followed by pea and tomato during refrigeration at 6° C. Vitamin C retention for each vegetable for cooking and refrigeration was compared and processing rate for substantial vitamin C content was recommended.

Key words: *Effect, vitamin C, cooking, refrigeration*

Introduction

Agrarian Bangladesh has faced problems of food security and malnutrition over the years. Being an overpopulated area it appeared to be difficult to meet the food requirement for the overall population in the country. Problems of food-security and malnutrition are multi-faceted involving various social, technical and institutional factors. There has been increased production of food over the last decade, albeit its influence on food security and malnutrition improvement is not earmarked.

One of the policy promulgations to solve the problems of food security and malnutrition has been the diversification of crop cultivation and consumption patterns since 1990s in Bangladesh. Several interventions like Crop Diversification Programme, North-west Crop Diversification Project were undertaken to diversify the cultivation patterns and increased production of vegetables, pulses, oilseeds, fruits etc. The government has initiated national nutrition programme since mid-1990s to increase the homestead production and consumption of vegetables and fruits. As a result, production of vegetables such as tomatoes and beans jumped from 86 thousand Mtons and 37 thousand M.tons in 1991-92 to 100 thousand M.tons and 49 thousand M.tons in 1999-2000 respectively. Per capita availability for consumption of these vegetables also increased from about 1 kg to 4 kg (BBS, 2000). Despite increase in production of vegetables malnutrition status of the

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people in Bangladesh has not been improved significantly. One of the causes of this problem can be attributed to the deficiency of nutrients such as vitamins. Both water and fat soluble vitamins are necessary for effective functioning of human body system. The former group of vitamins must be supplied every day as there is a minimal storage facilities of dietary excess. These accessory food factors are excreted in urine. The most significant fact about this group is that they have been found to function as coenzymes for specific enzymes systems. These enzyme systems are essential for various metabolic processes of the cell (Aurand and Woods, 1979). Several skin diseases including scurvy have been reported due to the deficiency of vitamin C.

Pea (*Pisum sativum)* is a protein rich vegetable grown in Bangladesh. It also contains significant amount of vitamin C (40mg/100gm). The country bean (*Lablab purpureas*) is popularly known as 'seem' in our country. It is one of the major winter vegetables grown in Bangladesh. It has high protein content and good digestibility and is free from flatulent affects, which are common in many legumes especially in case of certain pulses. Tomato (*Lycopersicon esculentum*) a member of the *Solanacea* family is one of the most important vegetable grown in Bangladesh during rabi season. It is cultivated in all parts of Bangladesh (Hoque *et al.*1999). The average yield of tomato in Bangladesh was 6.91 tones per hectare in the year 1999 (BBS, 2000). 100g of edible portion of tomato contain 31mg Vitamin C (Bose, 1985).

Many desirable changers as well as undesirable reactions occur in food when they are subject to thermal processing. Heating and cooling characteristics of foods must be well understood to bring about intended changes in foods during processing (Heldman,1974). Heating through conventional cooking involves surface absorption by radiation and conduction resulting in an uneven temperature profile throughout the product, thus necessitating a longer cooking time to obtain a given internal product temperature. The influence of conventional and microwave cooking on vitamin C losses are confirmed (Gorden and Noble, 1959, Kylen et.al., 1961, Mabesa and Baldwin, 1977). However, the analysis of vitamins in foods after they have been processed is often restricted to those exhibiting greatest lability in a particular food system. Vitamin C, known also as ascorbic acid, is used as an 'index nutrient' for predicting losses in vegetables and fruits during their processing and preparation because of its lability and solubility.

Refrigeration and conventional cooking (boiling) are two important thermal processing methods used for homestead food storage and preparation respectively in Bangladesh. As these two thermal processing methods have influence on vitamins, it is necessary to know their effect on vitamin C contents of vegetables such as pea, bean and tomato which contain substantial amount of this vitamin. Knowing the effect of these two thermal processing methods may be helpful for suggesting a processing rate for optimum vitamin C retention during homestead food preparation.

Methodology

Basic Procedure

Locally available fresh pea, bean and tomato were used in the study. Vitamin C content (mg/100gm) of fresh vegetables was determined. The sample was cooked (boiled) in water at 100° C. At first, the water was boiled to 100° C. The vegetables were then cut into pieces and poured into the hot water. Vitamin C content of the vegetables was determined after certain time intervals (3 min., 6 min., 9 min., and 12 min). Refrigerator available for homestead use was used for refrigeration of the vegetables. At first, fresh vegetables were packed in polythene and then it was kept in refrigerator. The vitamin C content of the vegetables was determined after 1 day, 3days, 5days, 7days, 9days and 11 days interval, respectively. This experiment was done in the BAU food technology lab in January to May 2003.

Vitamin C Determination

Using 3 % meta- phosphoric acid and 2, 6 dichlorophenol indophenols vitamin-C content of the vegetables was determined following the method of AOAC (1975). The formula used to calculate vitamin C content of the samples is as follows.

$$\text{Vit - C (mg/100 gm sample)} = \frac{T \times D \times V_1}{V_2 \times W} \times 100 \quad \text{---------- (1.0)}$$

Where,

T=titer

D=dye factor

V_1=volume made up

V_2=aliquot of extract taken for estimation

W= weight of sample taken for estimation

Analysis of Experimental Data

According to Heldman (1974) any reaction which is typical in nature will occur at a rate dependent upon several factors, whether the reaction is the conversion of sucrose to glucose and fructose or at the rate at which some component (such as vitamin C or thiamin) of a food is reduced in concentration by heat. The rate of the reaction is indicated by a rate constant (K) and can be described by the following general equation :

$$-\frac{dc}{dt} = KC^m \quad \text{----------(1.1)}$$

where C represents the component concentration at any time (t), and m represents the order of reaction.

Although many reactions may be of zero order, the first order reaction is described by the following equation , common in food products:

$$-\frac{dc}{dt} = KC \text{ ----------(1.2)}$$

In this particular type of reaction , the reaction rate is directly proportional to the concentration of the reacting substance (C).The application of a first order reaction equation becomes more evident if the equation 1.2 is solved and expressed in the folowing form:

$$\ln \frac{C}{C_0} = -Kt$$

$$\ln C = \ln C_0 - Kt \text{ ----------(1.3)}$$

Results and Discussion

The obtained experimental data for cooking were analyzed by equation 1.3 and plots of vitamin C content versus cooking time were made on semi log coordinate and regression lines were drawn **(Fig 1).** Furthermore, three regression equations were developed and written as:

mg% of vitamin C = $25.587e^{-0.1754t}$ (for pea, t= time in min.)---------- (3.1)

mg% of vitamin C = $13.084e^{-0.1025t}$ (for bean, t= time in min)---------- (3.2)

mg% of vitamin C = $17.453e^{-0.1833t}$ (for tomato, t= time in min)--------- (3.3)

The above set of equations are of first order type or exponential type and it is evident from the nature of equation and Fig.1 that the reactant (vitamin C) reduces rapidly at the beginning period (at 3 minute), while the rate of reduction or loss is very low at the end and as time progresses the rate of loss reduces.

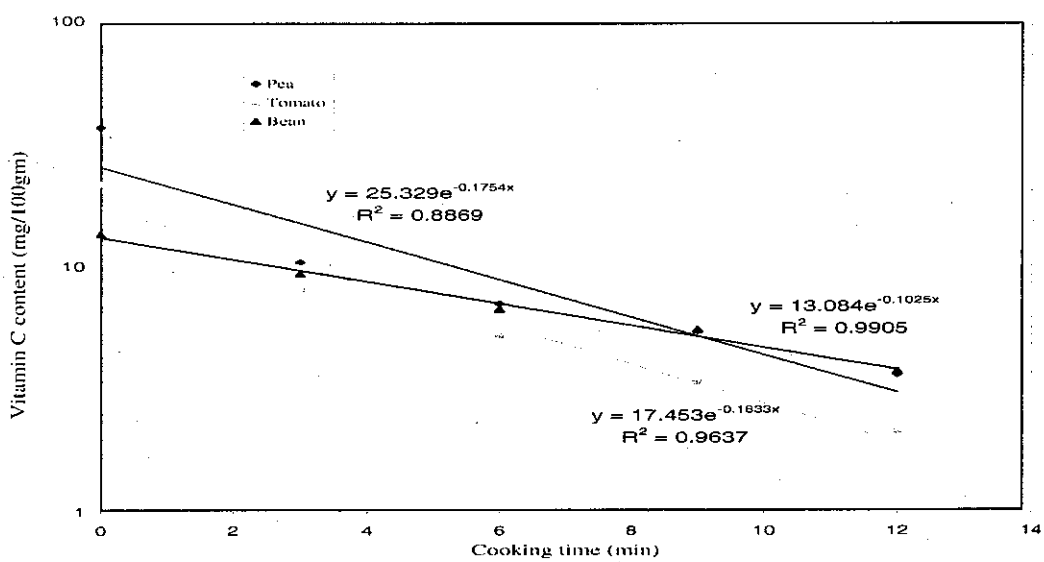

Fig.- 1: ***Effect of cooking on vitamin C content of vegetables***

From fig.1 and the equations (3.1, 3.2, 3.3), it is also evident that the reaction rate constant K is the highest (0.1833 mg% min^{-1}) for tomato and lowest for bean (0.1025 mg% min^{-1}) and value of K for pea is slightly lower than that of tomato i.e. K for pea is 0.1754 mg% min^{-1}. The results indicate that vitamin C losses are the highest in tomato followed by pea, while bean shows the lowest amount of loss at a given time. The losses of vitamin C have been attributed to several factors such as heat, light, oxygen, leaching etc. During cooking, losses occur mainly due to heat and leaching. According to Irvin (1998) heating in water, (like cooking broccoli in boiling water) causes the vitamin to leach out of the food into the water and also to be oxidize, first to dehydroascorbic acid and then to diketogulonic acid. This last compound has no vitamin C activity at all, and is, irreversible. However, the differences in K value may arise due to the difference in composition and heat transfer characteristics of the products.

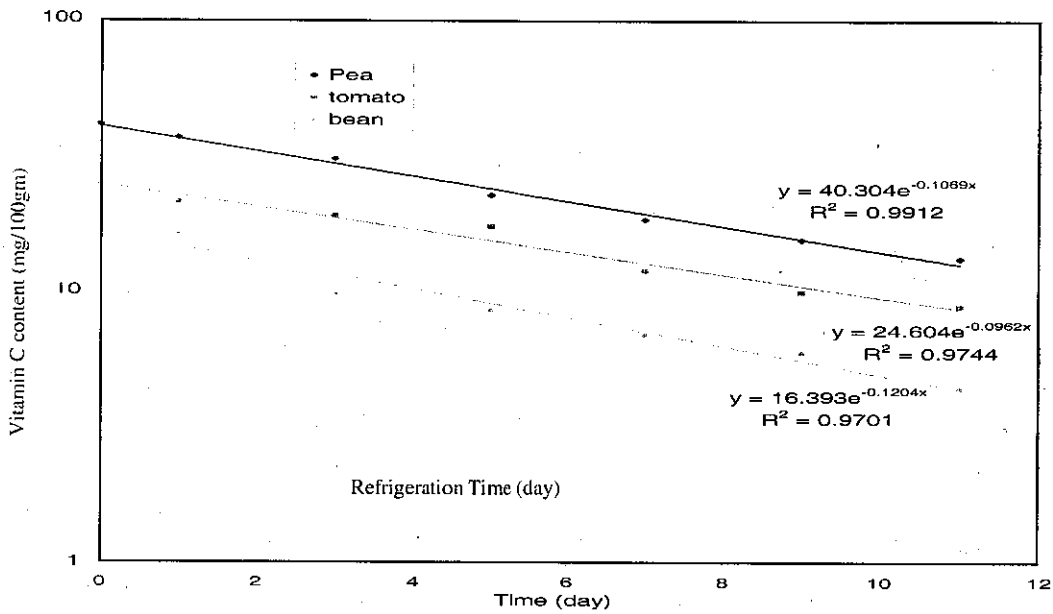

Fig. 2: ***Effect of refrigeration on vitamin C content of vegetables***

The data obtained for refrigeration were analyzed by the equation (1.3) and plots of vitamin C versus refrigeration time were made on a semi log coordinate (Fig. 2). The following regression equations were obtained from the regression analysis:

mg% of vitamin C = $40.304e^{-0.1069t}$ (for pea, where t= time in day)-------- (3.4)

mg% of vitamin C = $13.084e^{-0.0962t}$ (for tomato, where t= time in day)---- (3.5)

mg% of vitamin C = $17.453e^{-0.1204t}$ (for bean, where t= time in day)------- (3.6)

The above set of equations are of first order type or experimental type and it is evident from the nature of the equation (Fig. 2) that vitamin C reduces rapidly at the beginning period (up to 5^{th} day in case of pea and bean and up to 7^{th} day in case tomato), while the rate of reduction or loss is very low at the end and as time progresses the rate of loss reduces.

From the Fig. 2 and equation no. (3.4), (3.5),(3.6), it is also evident that the reaction rate constant k is highest (0.1204 mg% min^{-1}) for bean and lowest for tomato (0.0962 mg% min^{-1}) and value of K (0.1096 mg% min^{-1}) for pea is slightly lower than that of bean. These results indicate that the ascorbic acid losses are the highest in bean followed by pea while tomato has the lowest amount of vitamin C loss at a given time of refrigeration at 6° C. These differences may be attributed to the differences in composition and heat transfer characteristics of the products.

Vitamin C retention (percent retention) values obtained during different thermal processing at specific temperature and different time interval were tabulated to facilitate comparison of vitamin C retention. Data presented in Table 1 indicate that percent retention is more during refrigeration compared to cooking.

Table- 1: Percent Retention of Vitamin C During Cooking and Refrigerator

Time (min)	Percent retention of vitamin C during cooking (100 ° C)			Time (day)	Percent retention of vitamin C during refrigeration (6° C)		
	Pea	Bean	Tomato		Pea	Bean	Tomato
3	27.8	69	37.4	1st	89.5	95	86.1
6	19.18	49.7	24.2	3rd	74.8	57.6	76.9
9	14.89	41	15.7	5th	54.8	49.8	69.8
12	9.9	27.8	9.8	7th	45.5	40.6	48.1
-	-	-	-	9th	37.5	34.9	40.1
-	-	-	-	11th	33.6	25.9	35.7

Data presented in Table 1 indicate that at different temperature percent vitamin C retention is highest in case of bean compared to tomato while it is lowest in case of pea at a given time of cooking. However, less time of cooking shows more percent retention of vitamin C in case of all the vegetables. It was calculated that vitamin C loss in gaining boiling temperature (100° C) was highest in case of bean (20% vitamin C of raw material), lowest in case of pea (9.8 % vitamin C of raw material), and it is 12% in case of tomato. It is evident that pea showed about one-fifth, bean about half and tomato about one fourth retention of total vitamin C content of raw product at 6 minutes of cooking while at 12 minutes, cooking percent retention is one tenth for pea and tomato and one-fifth for bean. Liu *et al.*(2002) found that when tomato samples were heated to 88° C (190.4° F) for two minutes, a quarter-hour and a half-hour vitamin C content decreased by 10, 15 and 29 percent, respectively. Therefore, it can be inferred that six minutes cooking can render substantial vitamin C retention for pea and tomato and it can be 12 minutes for bean.

Data furnished in Table 1 indicate that percent retention of vitamin C is higher for bean compared to pea and tomato in case of short duration of storage (at 1st day) but with the increase of storage time (after 1st day) percent retention remains higher in case of tomato compared to pea and bean. However, in all cases, the lower the storage time, the higher the percent retention of vitamin C at 6° C. It is evident that the highest loss of vitamin C occurs between 3rd and 5th day in the case of pea (20%), 5th and 7th day in case of tomato (21.7%) and 1st and 3rd day in case of bean (37.4%). Suthar and Bhatnagar (1999) observed highest total soluble sugar, reducing sugar, ascorbic acid and lycopene contents during storage for 4 to 6 days at 4° C. Giannakounou *et al.* (2001) found that low temperature showed more benefit in respect of vitamin retention during refrigeration of peas.

Conclusion

The analysis of the results shows that vitamin C losses during conventional cooking are the highest for tomato followed by pea, while bean shows the lowest amount of loss at a given time. Substantial vitamin C retention for pea (one-fifth of vitamin C in raw product) and tomato (one-fourth) can be achieved for six minutes cooking at 100° C. On the other hand, cooking of bean up to 12 minutes can retain one-fifth vitamin C of raw product. Vitamin C losses are the highest for bean followed by pea while tomato gives the lowest amount of vitamin C loss at a given time of refrigeration at 6° C. It can be concluded that the higher the storage time at 6° C, the lower the vitamin C retention for any vegetables. Also evident that the highest loss of vitamin C occurs between 3rd and 5th day in case of pea (20%) , 5th and 7th day in case of tomato (21.7%) and 1st and 3rd day in case of bean (37.4%). Therefore, it is recommended that bean should be stored not more than 2 days for better vitamin C content, while pea can be stored for 3 days and tomato for 5 days with substantial vitamin C content.

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Socioeconomic Development Endeavours in the Northern Region of Bangladesh by the Association of Community Development (ACD): An Appraisal

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Abstract

Association for Community Development (ACD, an NGO) emerged as a key non-government organization in 1989 in response to the basic needs and aspirations of the people, especially of Women, Children and adolescent girls of Rajshahi district. Over the years, ACD provided extensive support for its target people through its ongoing programmes. The study finds out that through its committed and continuous efforts, ACD has become successful for empowerment of the poor, generated a wave of activities against the trafficking of women and children. The study revealed that ACD has successfully adopted a number of multiple development activities to initiate self governance, self-empowerment, self–reliance and entrepreneurship of the grass-root women. ACD is actively involved in promoting womens' rights, human dignity and gender equity, poverty alleviation and institutional capacity building for the hard-core poor population in the northern part of Bangladesh.

Key Words: *Socio-economic development, women's empowerment, poverty alleviation, institutional capacity building*

Introduction

In Bangladesh, except for a few international NGOs, there is little evidence of indigenous NGOs operating before independence. Initially NGOs emerged in Bangladesh after the war of independence in 1971, to undertake relief and rehabilitation activities and to mitigating the sufferings of the war torn people thereby. Their activities included distribution of food, medicine, and clothes; construction of shelter, and physical infrastructures, and distribution of productive assets among the victims (Siddique and Mustafa, 1992; Rahman, 1992). The charity and welfare oriented activities of NGOs continued till 1974. Thereafter, they undertook integrated community development program, hoping that an improvement in the quality of life of the poor would occur automatically with the overall development of the country. Besides mobilizing the poor, the NGOs also provided to them various support services ranging from training, credit, income-generation, health, education, etc., to developing the competence of the poor and their economic empowerment. Over the past two and half decade NGOs have concentrated their efforts in specific

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areas of interventions in consonance with their long-term objectives and vision. Such areas my be identified as disaster management, targeted assistance to the poor, new models of credit programs for the poor, primary health care, women's rights, environmental awareness, and legal aid and human rights (Rahman, 1992).

Apart from the government agencies, a large number of non-government and voluntary organizations started engaging simultaneously in activities for the socio-economic uplift of the rural poor and rural development. The number of NGOs increased significantly over the years. Bangladesh has had a tradition of substantial socio-economic development undertaken through indigenous and historical voluntary efforts and activities. However, increasing degree of professionalism and specialization among the NGOs for welfare and development are only phenomena of recent phenomenon. NGOs in recent years have expanded their activities over large areas and in different fields. Also, NGOs work in the community in an integrated approach in the long run perspective (Bhuiyan, 1992).

Association for Community Development (hereafter ACD) was established as a local women-headed development organization with a primary mandate to work for human rights in general and women and child rights in particular in the Rajshahi region (ACD annual report, 2001). ACD emerged as a non profit, non-government human rights and development organization in 1989 by a group of social activists in response to the chronologically growing needs and aspirations of the people, especially of landless destitute women and children. For more than a decade, ACD implemented as many as 13 major projects focused and committed to empowering the most disadvantaged women, children and adolescent girls whose life remain under the repressive and suppressive social environment dominated by norms and values of the traditional patriarchal society and economic hardship. Since its inception, no study has been conducted in relation to evaluation of its activities which may help to improve the quality of this NGO. So it is imperative to undertake an evaluation study attempting to know the role of ACD as a local level NGO for socio-economic development in the northern region of Bangladesh.

II. The Specific Objectives of the Study

The main objectives of the study were:

(i) to identify and determine the different activities of ACD and the impact of its various programmes on the socio-economic development in Bangladesh particularly in the Rajshahi district, and

(ii) to analyse the performance of the ACD in terms of its yearly achievement.

III. Methodology

This paper has been organized through intensive library work. Information has been collected from both primary and various secondary sources. Secondary data are collected from the annual reports of the ACD. Stories of group members in this study are incorporated from field observation. Particulars/Address of the group members has been collected from the Officials of ACD's regional office.

IV. Emergence of ACD

Association for Community Development (ACD) emerged as a key non-government organization in 1989 in response to the basic needs and aspirations of the people, especially of women, children and adolescent girls of Rajshahi district. It was established as a local women-headed development organization with a primary mandate to work for human rights in general and women and child rights in particular. The declared commitment of the organization is to provide support to the disadvantaged women and children to enhance their own initiatives and collective action with the aim of achieving quality of life and for their empowerment (ACD annual report, 1993).

V. Mission and Vision of ACD

Vision: The community care system is to develop and the disadvantaged women, children and adolescent girl of the working area are to empower socio-economically and to establish their rights.

Mission: ACD was established as a local women-headed development organization and to work for the 'Integrated Development' approaches. In the context of human rights and sustainable development, ACD framed its mission statement as mainstreaming women's issues for gender balanced partnership and others are to:

- improve the socio-economic status of the disadvantaged women, children and adolescent girls through economic empowerment and establishing rights;
- provide functional literacy both to children and adults to eradicate illiteracy and ignorance;
- promote community management to initiate economic, social and cultural activities for sustainable development;
- ensure poor women's access to justice;
- develop institutional capacity in establishing good governance and accountability; and
- conduct advocacy and awareness campaign against child and woman trafficking, sexual exploitation and provide emergency shelter and rehabilitation for the victims.

VI. ACD's Activities

ACD has clustered its activities into three sectors, which are:

1. Human Rights Sector

Under Human Rights Sector the programmes are as follows:

1.1 Gender and Social Justice

This programme operates with the aim of reducing gender-related discrimination, establishing social justice for grassroots women, preventing violence against woman, access to justice and building woman's capacity at grassroots level through providing them with skill development and

issue-based training. The programme also includes the democratic development of woman leadership for establishing woman's rights and preventing violence against them. ACD has also facilitated pressure groups at grassroots level, which is playing a role in the prevention of violence against women and monitoring it as a watchdog. It has been working with 2154 male-female-adolescents groups in its working areas and has provided social education, awareness program and gender training, etc., through the group approach. It has been accomplished to ensure the involvement of 240 youth groups in the gender and social justice in order to improve gender based disparities in 2005.

ACD has been working for a long time to activate the traditional Salish system into a proper and effective process at the community level. Through this, ACD wants to develop a positive community mechanism and support system of social justice towards women and grassroots people. In 2005 ACD has successfully operated Salish program through its 74 (previously formed 24 and 54 newly formed) Salish committees.

The organization conducts investigation of the incidence of human rights violation in order to ensure justice and access of justice for the grassroots people and carry out advocacy and lobbying with the Local Elected Authorities (LEAs) and administration. The investigation unit of the organization is carrying on with its activities for the proper application of human rights and law in its working areas. In the year 2005, this unit has done investigation of 42 incidences among which it has done lobbying with the LEAs and administration with the investigation reports of 36 of the incidences.

1.2 Women's Empowerment

Women's socially subordinate role places them at a risk of gender based violence because they are women and do not have the same rights as men do. Widow and female-headed households are often portrayed as one of the most vulnerable groups. Violence against women is a global violation of human rights with its roots lying in the unequal power relation between men and women. Deprivation of productive assets puts women at structural disadvantage and contributes to violence. At the same time, there is considerable evidence of violence against women who are making claims to property rights. In this case ACD's main initiatives are to organize training, orientations, meetings, seminars and workshops on the matters of CEDAW, uniform family code, human rights, reproductive health and rights, gender and development at the grass roots level towards a positive change of women's condition so that a positive environment of social mobilization is created. The organization also provides training on capacity building and leadership development to the elected female members of the Union Parishad (UP) along with taking steps for increasing women's participation in the democratic process and institutions and playing their appropriate role.

Women who become empowered to act to meet their own needs can also contribute to developmental for the wider society. Empowered women, especially within an organization where collective empowerment can become possible, are more likely to act to exert political pressure for change in favour of essential development needs (Prasad and Sahay 2000). ACD has increased the involvement of various government officials, UP chairman, local elites, social and religious leaders,

journalists and teachers, and institution of the grassroots power structure and made them functional. It organises orientations, meetings, seminars, workshops and training on women empowerment. As a result of which a positive change is being noticed regarding social attitude towards women leadership.

1.3 Combat Trafficking

Trafficking has been prevailing for a long time as a social problem in the northern part of Bangladesh. Poverty, dowry, fotowa (*decision given by the local religious leader*), divorce, polygamy, hilla marriage (*marriage with third party for a certain period of time according to the rules of Muslims religions*) and early marriage are identified as the root causes of trafficking, which are prevailing in ACD's working areas (field survey, 2006). ACD has been working from the human rights perspective for a long time for the prevention of trafficking and its root causes and consequences. ACD has formed 47 - Counter Trafficking Committee (CTC) consisting of Union Parisad and social leaders. It has initiated the Peoples Organisations (PO), adolescent's groups, male and female groups, child rights forum, youth groups, CTCs for prevention of trafficking in an integrated approach. These organizations and groups are operating various activities. It is also conducting advocacy meetings, workshops and training programmes with the local government, administration, Police, Bangladesh Rifels, Ansar to prevent trafficking.

2. Child Rights Sector

Programmes of child rights sector are as follows:

2.1 Programme for Children Experiencing Hazardous Condition

ACD is operating shelter home, drop-in-centre, rural adolescent girl's program and socialisation centre along with community intervention with a view to preventing, protecting and improvement of the situation of targeted children. ACD is accomplishing the overall development of the children through rights based program for the disadvantaged, victims of sexual abuse, and violence and who are at risk and belong to the socio-economically and culturally backward section of the society.

2.1.1 Shelter Home

ACD is operating the shelter home under the psychosocial support programme for the children who are victims of violence, trafficking, rape, acid burn and who are in difficult situation or at risk. The children of shelter home are rescued by the different groups and social workers of ACD at community level organizations and key informers, law enforcing agencies and judicial referral units. After rescue these children are kept in shelter home and provided several services. It is noted that different forms of cultural intervention are applied for the improvement of psychosocial condition of the children in the shelter home. In 2005, 57 girl and 48 boy victims of violences of such types have taken the services from the shelter home.

2.1.2 Drop-in-Center

ACD is operating the drop-in-center for the street-working children aged 5-18 years in hazardous job and difficult circumstances at urban settings. The objective of the program is to work in the rights based approach for the protection and minimal care of these children. The shelter, food, health service, formal and non-formal education, life skill based education, vocational training, psychosocial counseling, job placement etc. are provided to the children in the Drop-in Centre. Besides, the organization provides different life skill based awareness trainings on health, trafficking, STD/HIV/AIDS etc.

2.2 Programme for Promotion of Child Rights

ACD operates this programme for the children of the urban slums and rural community in rights based community approach. These children are disadvantaged, tortured, victim of violence, sexually abused and exploited in different ways and at risks of unsafe migration. ACD is taking initiatives for these children and is going to work for improvement of the community care system in preventing violence, abuse and exploitation towards them with a view to building a child friendly social environment.

2.2.1 Rural Adolescent Programme

During the year 2005 ACD's rural adolescent girls program assisted 218 girls from different categories of risk background. They have been provided life skill training and skill development training and also supported by non-formal education. Among those girls 22 were admitted in to formal school. The rural adolescent program in operation for the care and protection of the violence victim children, children in hazardous conditions and the children at risk of violence. ACD also provided micro credit support to adolescent girls in order to building their skills, empowerment and in preventing the violence on them.

2.2.2 Rural Socialization Centre

Socialization centre is semi-institutional center for rural underprivileged and vulnerable children to make positive impact in their communities through awareness, non-formal education and recreational facilities. Socialization center is designed in such a way that the adolescents at risk and the rural vulnerable boys and girls can be helped to realize their potential and to find positive aspects of life, making their socialization, reintegration into community and empowerment possible. ACD has provided various kinds of support to the children and working children for their socialization, capacity building, and empowerment. During the year 2005, ACD's socialization center has provided different services including socialization, psychosocial counseling and family reintegration to the 330 number of children who are at risk, and survivors of child labour exploitation.

3. Institutional Management and Capacity Building

Under this program activities are:

3.1 Institutional Capacity Building

ACD has formed and developed community organizations at the grassroots levels and set up these as center for development. It has been taking different steps to operate the activities through integrated approaches.

3.1.1 People's Organization

ACD has organized 150 people's organization (PO) in rural areas and strengthen community's own initiative at grass root level in order to bring sustainable development and establish human rights, economic development, and good governance through the proper utilization of community resources. Since 2003 a total 150 number of POs have been formed in the 150 villages of Rajshahi, Chapai Nawabgonj and Naogoan districts. The leadership training, management, and different income generating training have been provided to PO leaders.

POs are working to combat early age at marriage, polygamy, dowry, sexual abuse and exploitation of women and children, human trafficking and environment pollution along with different social and development activities in their own locality. Besides, the POs are working for birth registration practices involving different government initiatives with local government institutions. Now the women members are more positive.

3.2.1 Rural Micro Credit Programme

Micro credit is an important tool of social development through the economic empowerment of the disadvantaged people at grassroots level. ACD is operating the micro credit, horticulture and aquaculture programs at the grassroots level. Through these programs, ACD is active in exploring alternative livelihood options for the poor people at the grassroots level.

As a community approach based human rights and developmental organization, ACD's micro credit program approach of poverty alleviation is very effective in alleviating women's poverty and for recreation of self-employment. ACD provides group based and individual micro credit support to the women, men, and the adolescents in its working areas. In this case, the micro credit support program has played an optimistic role in increasing the income, acquisition of resource and growth of wage of the poor, which is observed in the ACD's target people. Also other many optimistic social effects of micro credit and micro entrepreneurship supportive activities are observed.

Case study: Anisa changed her lot

Anisa is 45 years old. She lost her husband nearly 15 years ago. She is living in Tanore Upazila of Rajshahi District for the last 30 years. She is blessed with 2 sons and three daughters. Cow rearing is her family occupation. Poverty was a common feature in her life. She became an active member of women's group with the help of ACD's field worker.

In the begining, she got a loan amounting to Tk. 3000. After that, she took Tk. 6000 and she bought a cow and repaid the loan by selling milk and saved some money, too. She had to pay 10% interest for the loan on flat system and in 50 instalments (i.e., 50 weeks).

After that she took a loan of Tk. 1,00,000.00. This time she took a risk and changed her option for income generation. She took a lease of 1 acre of cultivable land for growing vegetables. She had to pay Tk.2000 each year for the land. She was producing vegetables with a total value of Tk. 25,000 employing 5 agricultural labourers and now, she is a graduate agriculturist. Before receiving the loan, Anisa had to take a training on awareness development, organizational management and legal aid from ACD.

Now Anisa sees herself as an independent and confident woman. Anisa's remark "This type of economic support helps us a lot. Because we can try to regenerate our financial position and our economic conditions, too. It also gives us a lot of confidence." She also thinks that her economic activities and increased income have improved her position in the family (ACD, 2005).

Table- 1: Micro Credit Report: From 1993 to May 2006

Particulars	PKSF loan project			
	Charghat	Tanore	Shibganj	Total
Loan disbursement (Tk.)	66,959,000	23,671,000	8,079,000	128,709,000
Loan recovery (Tk.)	62,027,663	21,446,000	34,310,405	117,784,068
Present balance (Tk.)	4,931,337	2,225,000	3,768,595	10,924,932
Savings collection (Tk.)	7,546,741	2,605,697	5,951,379	16,103,817
Savings returned (Tk.)	5,167,997	1,708,295	3,862,864	0,739,156
Balance of savings (Tk.)	2,378,744	897,402	2,088,515	5,364,661
Outstanding savings (Tk.)	253,089	214,045	284,851	751,985
No. of Somitti	74	36	97	207
No. of members	1,415	679	2,208	4,302
No. of Loanee	1,098	585	1,194	2,877
No. of Village	23	23	32	78
No. of Union	2	4	5	11
No. of Thana	1	1	1	3

Source: *Annual Report and accounts from ACD 2006*

Micro Credit Programme is one of the core programme of the organization. This programme is identified as a right of the hard core poor. This collateral free credit to the poor as a key factor for addressing the problem of poverty. From the experiences of micro-credit programmes for the disadvantaged women it is realised that micro-credit has become a source to create opportunities for self employment which eventually leads to decision making power in the family.

VII. Significant Impact of ACD's Initiative on Socioeconomic Development

Bangladesh as one of the most densely populated countries in the world faces many problems of poverty, such as high illiteracy rate and low access to health care. The situation of the northern region of Bangladesh concerning food supply, immunization of children and access to safe drinking water has improved. Poverty level has been reducing and literacy rate is rising slowly. Life expectancy has also risen. ACD have emerged with a new generation of ideas to fight against poverty and gender inequality. It has been successful in organizing the rural poor and eradicating poverty. ACD began their work as village co-operative systems. The focus is now on the grassroots level. A significant feature of this phenomenon of grassroots ACD has been the rise of organizations providing a forum for the unorganized rural poor women. ACD has been focusing on areas such as women's education and health service and delivery.

Credit program can be a means to women's empowerment. Through the credit group the women have access to money. The money borrowed from the ACD helps them raise their position towards their husband and other house hold members, and their self-confidence is increased. As a result their practical needs are largely fulfilled and the family and the community recognize their strategic needs, as both their conditions and positions begin to change. The credit program has a visible impact on the women's empowerment and socio-economic development. The women's bargaining position in the home increases as they enhance their economic contribution to the family.

VIII. Achievements of ACD Since Inception

- ACD has been implementing the comprehensive program by an integrated approaches and gained success and experience. In 2004 there were 75 Peoples' Organizations (POs), 31 CTC, 38 Salish Committee, 540 male, female and adolescent groups respectively. Whereas in 2005, it has been working through 150 Peoples' Organization (*100% increases than 2004*), 41 Counter Trafficking Committee (32 % increases), 78 Salish Committee (105 % increases), 2154 Male, female and adolescents' groups (299 % increases) and 240 youth groups in its working areas. In order to protect and implement Child Rights program the organization has been operating two shelter homes, two Drop-in-Centers, and five Socialization Centers with its community based interventions in 2005.

- With the aim of preventing violence against women, reducing gender based discrimination and establishing social justice, the organization is providing legal aid support to 45, advocate 33 number of violence related cases through investigating 36 number of cases, providing a number of issue-based training programs for skills development and initiating the activity of leadership development of women for protecting the rights of women and preventing violence against them

during the period. The organization has successfully implemented all programs during 2005 more effectively than previous year according to its planned target (Please see table-2).

- The organization has been working to create an environment for youth friendly health service and provides the 2400 number of youth with life skills education between Rajshahi and Chapai Nawabganj districts to prevent HIV/AIDS in 2005. ACD has continued different entrepreneur based micro credit services in view of economic empowerment of the rural women who are both landless destitute. During the period it has provided micro credit to 5321 number of its beneficiaries with the credit plus services. The innovative adolescent micro credit program operated by the organization has gained appreciation from the development partners and the community people.

- In the year 2005, ACD has taken 10-year strategic plan. Besides, it has set up area management team in each area office through which every area office can be making decision and implementing the programs according to the demand and situation of the area (ACD, 2005).

Table -2: Activities Conducted by the ACD During 2001-2005

Activities	2005	2004	2003	2002	2001
Legal Aid Support	45	38		17	17
Advocated Violence Cases	33	23	17		30
Issued Based Training Programmes	92	74	68	66	114
Organize Meeting, Seminar, Orientation & Workshop	214	113	203	184	66
Salish Committee –Cases Resolved	186	145	174	279	158
Socialization Centre		4			
Drop-in-Centre -Shelter & Care (Children)	2 2521	2 600	2 896	2 946	2 2200
Covered Upazila	19	15	15	15	15
Unions	61	57	57	57	57
Districts	3	3	3	3	3
Villages	1250	1250	1220	1220	837

Source: Annual Report, ACD 2001-2005

IX. Challenges Faced by the ACD

- ✓ The organization usually faces the political pressure when it goes to initiate the social action plan against violence on women and children. During 2005, the organization has faced such type of challenges in a number of cases.
- ✓ The organization faced the challenges such as creating alternative livelihood security due to scarcity of resources, funding; social reality, where different types of material support were required which is impossible for delivery by the organization.
- ✓ ACD has been facing the problem to keep the impact of the program in its own track and maintaining continuation of the program due to the short -term project oriented support. On the other hand the delay of the fund disbursement by the donor also hampered the program implementation according to its planned time frame.

Conclusion

ACD is actively involved in promoting women's rights, human dignity and gender equity, poverty alleviation and institutional capacity building for the hard-core poor population in the northern part of Bangladesh. As an NGO, ACD cannot change community's overall position but can work for motivating the community towards changing their perception and help them to developing themselves over and above implementing the development projects. ACD has been facing some socio-political challenges as well as shortage of fund to continue its programs. To run the organization smoothly and successfully for the socio-economic development, strong community support and sufficient fund from the government and development partners is essential indeed.

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Integrated Nutrient Management for Fallow-T. Aus-T. Aman Cropping Pattern in Surma-Kushyara Flood Plain Soil

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Abstract

The experiment was conducted at Golapgonj, Sylhet under Surma-Kushyara floodplain soil during the period from May to November 2003 to develop a nutrient management package for Fallow-T.aus- T.aman cropping pattern. Six treatments including balanced inorganic fertilizer doses for moderate (ED_1) and high yield goal (ED_2), nutrient management following Integrated Plant Nutrient System approach for high yield goal (IPNS), recommended fertilizer dose given in Fertilizer Recommendation Guide'97 (FRG'97), farmers' practice (FP) and absolute control were tested. Fertilizer doses were estimated as per treatment based on soil test values. The highest grain yield was obtained from IPNS in both T. aus (5.22 t/ha) and T. aman (5.42 t/ha) crops, which were closely followed by ED_2 (5.13 and 5.27 t/ha, respectively). Similar trend was observed in straw yield. Gross margin was highest in IPNS (Tk. 77025.90/ha) followed by ED_2 (Tk. 76903.53/ha). Variable cost was maximum in IPNS (Tk.8136.10/ha) because of additional cost of cowdung for higher price and larger quantity. Consequently, this treatment performed the lower marginal benefit cost ratio (5.33) comparative to ED_1 (7.26) and ED_2 (6.55). But in sense of net return and soil health, IPNS was the most profitable dose.

Key words: *Integrated nutrient management, high yield goal, moderate yield goal, fallow-t. aus-t. aman cropping pattern, surma-kushyara floodplain soil*

Introduction

Fallow - T. aus - T. aman is the dominant cropping pattern in the Sylhet region under rainfed medium highland and medium lowland areas of Surma-Kushyara floodplain. The productivity of the cropping pattern is not satisfactory under existing farmers' practice due to intensive use of high yielding varieties, imbalanced use of fertilizer and higher decomposition of organic matter. In soil- plant system there must be a balance between input and output of nutrients for sustainable agriculture (Bhuiyan *et al.*, 1991). The use of chemical fertilizers has been increasing steadily but usually they are not applied in balanced proportions (Anon., 1997). Farmers mostly use NPK fertilizers and do not apply sulphur, micronutrients or organic manures. They apply fertilizers for

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high yield goal without considering the residual nutrients of the preceding crop. Organic or inorganic sources of nutrients applied to preceding crop can benefit the succeeding crop to a great extent (Hegde, 1998; Singh *et al.*, 1998). Imbalanced use of inorganic fertilizers, little or no addition of organic manure and poor attention to its improvement and maintenance made the situation difficult. As a result, the soil fertility in Bangladesh is in declining trend (Karim *et al.*, 1994; Ali *et al.*, 1997), which is responsible for declining crop yields (Cassman *et al.*, 1995; Anon., 1996). Hence, a judicious integration of chemical fertilizer along with organic manure may help maintain soil fertility as well as increase crop productivity. The present study was undertaken to find out a cropping pattern based integrated fertilizer recommendation for Fallow - T. aus - T. aman cropping pattern under Surma-Kushyara Floodplain soil.

Materials and Methods

The experiment was conducted in the farmers' field of the BARI Farming system research and development site, Golapgonj, Sylhet with Fallow - T. aus - T. aman cropping pattern during the period from May to November, 2003. The site belonged to rainfed medium highland and medium lowland areas of the Surma-Kushyara Floodplain (AEZ-20). Before starting the experiment, initial soil samples were collected from each farmer's field and analyzed. The soil was clay loam with low organic matter content (1.86%) and soil pH was 5. The status of N, P, K, S, B and Zn was low, very low, low, medium, optimum and optimum, respectively. Total rainfall was 3474.2, 3635.9 and 3667.3 mm in 2001, 2002 and 2003, respectively. Average maximum temperature of three years was 30.32^{0}C and minimum was 20.71^{0}C. Initial nutrient status of the selected farmers' plots is presented in Table-1.

Table- 1: Initial Soil Nutrient Status of Different Selected Farmers' Plots

Sample no.	pH	OM (%)	Total N (%)	K (meq/100g soil)	P	S	B	Zn
					(µg/g soil)			
1	6.1	1.34	0.08	0.07	2	10	0.43	1.2
2	4.5	2.01	0.11	0.15	4	18	0.75	2.2
3	4.1	1.35	0.08	0.06	5	35	0.56	1.6
4	4.7	2.46	0.15	0.11	3	23	0.63	1.3
5	5.8	1.90	0.10	0.06	4	18	0.56	1.5
6	4.8	2.10	0.12	0.08	3	23	0.49	1.8
Average	5.0	1.86	0.11	0.09	3.5	21.17	0.57	1.6

The experiment was laid out following RCB design with six dispersed replications. The unit plot size was 10 m × 10 m. The treatments were - T_1: Estimated inorganic fertilizer dose for moderate yield goal (ED_1), T_2: Estimated inorganic fertilizer dose for high yield goal (ED_2), T_3: Nutrient management following Integrated plant nutrient system approach for high yield goal (IPNS), T_4: Recommended fertilizer dose given in the Fertilizer Recommendation Guide'97 (FRG'97), T_5:

ইতোমধ্যে সিভিডিপিভূক্ত সমবায় সমিতিগুলো নিজস্ব তহবিল হতে গরু মোটাতাজাকরণ, হাঁস-মুরগী পালন, মৎস্য চাষ, রিক্সা-ভ্যান চালানো, নার্সারী স্থাপন, হস্তশিল্প প্রভৃতি আয় বৃদ্ধিমূলক কর্মকান্ড গ্রহণ করেছে। ঝুঁকি থাকা সত্ত্বেও অধিকাংশ সমবায়ী গরু মোটাতাজাকরণ, ব্রয়লার মুরগীর খামার ও মৎস চাষ লাভজনক বলে মতামত ব্যক্ত করেছেন। এর পরেই রয়েছে নার্সারী ও দর্জি ব্যবসা। দীর্ঘ মেয়াদী প্রকল্প হিসাবে সমিতিগুলো ব্যাপক বৃক্ষরোপণ করেছে। এসব ব্যবসায় সদস্যদের কর্মসংস্থান ও আয় বৃদ্ধি পেয়েছে।

সারণী- ২ঃ খাতওয়ারী ঋণ বিতরণ

ক্রমিক নং	ঋণের খাত	বিতরণকৃত ঋণের পরিমাণ (লক্ষ টাকা)	ঋণ গ্রহীতার সংখ্যা	উপকারভোগীর সংখ্যা
১.	ক্ষুদ্র ব্যবসা	২৯.৭৫	৫৮০	২৮৭০
২.	কৃষি উপকরণ ও যন্ত্রপাতি	১৭.১৭	২৮০	১৩৯০
৩.	গরু মোটাতাজাকরণ	১৫.৯৬	১৫৮	৪২৬
৪.	রিক্সা-ভ্যান চালনা	১৩.৫৮	৩৪০	১৭৮০
৫.	মৎস্য চাষ	৮.৪৫	৯২	৩৮৮
৬.	মজুদ ব্যবসা	৩.৩৩	৩২	১৪২
৭.	মুরগীর খামার স্থাপন	১.৬৫	১৭	৭৮
৮.	হাঁসের খামার স্থাপন	০.৭০	২২	৯০
৯.	সেলাই	০.৬৫	১৪	৭২
১০.	হস্তশিল্প	০	০	০
	ক) সূচীকর্ম	১.১০	১১০	৪৭২
	খ) উলের কাজ	১.০০	৯৮	৪০২
	গ) বাঁশের কাজ	০.৬০	৫২	২২৬
	মোট	**৯৩.৯৪**	**১৭৮৯**	**৮৩২৬**

উপরোক্ত তথ্য থেকে দেখা যায় যে, ক্ষুদ্র ব্যবসা ও কৃষি ক্ষেত্রে সবচেয়ে বেশী ঋণ বিতরণ করা হয়েছে। তারপরের অবস্থানে রয়েছে গরু মোটাতাজাকরণ ও রিকসা-ভ্যান প্রকল্প। এখাতে ঋণের পরিমাণ কম হলেও কর্মসংস্থান সৃষ্টির ক্ষেত্রে অগ্রগামী। সদস্যদের মাথাপিছু বাড়তি আয়ের সংস্থান এসব খাতেই বেশী। হস্তশিল্প খাতে স্ব-কর্মসংস্থান ও আয়বৃদ্ধির ফলে মহিলা সদস্যদের সামাজিক ও আর্থিক ক্ষমতায়ন ঘটেছে বলে উপকারভোগীদের সাথে আলোচনায় জানা গেছে। যেমন- মুরগীর খামার থেকে ঋণ গ্রহীতারা মাসিক গড় প্রায় ৬,০০০/- টাকা আয় করেছে। একইভাবে গরু মোটাতাজাকরণ প্রকল্পের সমবায়ীরা ৫/৬ মাসে গড় ১৪০০০/- টাকা থেকে ১৮,০০০/- টাকা পর্যন্ত আয় করেছে। সংসারের সকল কাজ করেও মহিলা সমবায়ীরা টুপি সেলাই, সূচীকর্ম, বাঁশের কাজ করে মাসে ৮০০/- টাকা থেকে ১৪০০/- টাকা পর্যন্ত বাড়তি আয় করেছে। এতে সংসারের স্বাচ্ছন্দ্য পূর্বাপেক্ষা বৃদ্ধি পেয়েছে। তাছাড়া ১৯টি সমিতি কৃষি জমি বন্ধকী/লীজ খাতে ও দুইটি সমিতি ডেকোরেটর খাতে ২৭.৩২ লক্ষ টাকা বিনিয়োগ করেছে। এ থেকে বছরে তারা বিশাল অংকের টাকা লাভ করে। যেমন- এক হিসাবে দেখা গেছে যে, সাদুল্যাপুরের ছান্দিয়ার, দঃ ইসবপুর কিংবা মিরপুরের কচুবাড়িয়াসহ ৫৭টি সার্বিক গ্রাম উন্নয়ন সমবায় সমিতি গত আট মাসে শেয়ার প্রতি ৭.০০ টাকা হারে নীট লাভ করেছে। উপরন্তু বৃক্ষরোপণ কর্মযজ্ঞে ৩০টি সমিতি প্রায় ১.৬০ লক্ষ টাকা বিনিয়োগ করেছে যা থেকে ৬/৭ বছর পর তারা ৪০০.০০ লক্ষ থেকে ৪৫০.০০ লক্ষ টাকা আয় করার আশা করছে। এ চিত্রে সমিতিগুলোর স্ব-নির্ভরতা ফুটে না উঠলেও তা স্ব-অর্থায়নে ঋণ কার্যক্রমের টেকসই প্রবণতা তুলে ধরে।

ঋণ কার্যক্রমের সামর্থ্য, দুর্বলতা, সম্ভাবনা ও আংশকা বিশ্লেষণ (SWOT Analysis)

সামর্থ্য (Strengths)

১) সমিতির সদস্যদের নিজস্ব অর্থ থেকে ঋণ প্রদান করা হয়। ফলে পুঁজি গঠন ও ঋণ ব্যবস্থাপনায় তাদের কর্তৃত্ব প্রতিষ্ঠা হয়েছে।

২) ঋণ প্রদানের ক্ষেত্রে সদস্যদের সিদ্ধান্তই চূড়ান্ত। তাই তারা চাহিদা ও সময়মত ঋণ প্রদানে সক্ষমতা অর্জন করেছে।

৩) সিভিডিপি-তে প্রশিক্ষণের সাথে ঋণের সম্পর্ক রয়েছে। তাই ঋণ পাওয়ার ক্ষেত্রে প্রশিক্ষণপ্রাপ্ত সমবায়ীরা অগ্রাধিকার পায়। ফলে ঋণের লাভজনক ব্যবহার নিশ্চিত হয়।

৪) সিদ্ধান্ত গ্রহণে সদস্যদের সক্রিয় অংশগ্রহণ ও প্রকৃত ক্ষমতায়ন ঘটেছে।

৫) ঋণের পরনির্ভরশীলতা কাটিয়ে ক্রমশঃ নিজের পায়ে দাঁড়ানোর শক্তি অর্জন করছে।

৬) গ্রহীতাদের কর্মসংস্থান ও আয় বৃদ্ধি দৃশ্যমান হয়েছে।

৭) ঋণ বাবদ অর্জিত সার্ভিস চার্জ লাভ হিসাবে পাওয়ার পর সদস্যরা সমিতির প্রতি অনুগত ও উৎসাহ বোধ করে। ফলে তাদের মধ্যে এক ধরণের ঐক্যবোধ ও সহমর্মিতা গড়ে উঠেছে।

দুর্বলতা (Weaknesses)

১) বেশকিছু সমিতি ঋণ আদান-প্রদানে পরিপক্কতা অর্জন করতে পারেনি।

২) প্রকল্প ঋণের কোন ব্যবস্থা নেই। ফলে ঋণ তহবিলের পরিমাণ খুবই কম। সকল সদস্যদের চাহিদা মিটানো সম্ভব হচ্ছে না।

৩) অনেক সমিতির মাথাপিছু ঋণ প্রদানের পরিমাণ কম। ফলে বড় ধরণের ব্যবসায় বিনিয়োগ সম্ভব হচ্ছে না।

৪) হিসাবের খাতাপত্রসহ ঋণ বিতরণ ও আদায়, সার্ভিস চার্জ বা সুদ আরোপ প্রভৃতি বিষয়ে ব্যবস্থাপনা কমিটির সদস্য এবং সমিতির হিসাব কর্মীদের প্রশিক্ষণের অভাব রয়েছে। ফলে খাতাপত্র রক্ষণাবেক্ষণে দুর্বলতা রয়েছে।

৫) দক্ষতা উন্নয়নমূলক প্রশিক্ষণের অভাবে অনেক ঋণ গ্রহীতা ঋণের সঠিক ব্যবহার নিশ্চিত করতে সক্ষম হয়নি।

৬) প্রয়োজনের তুলনায় ঋণ তহবিল বড় না হওয়ায় সকলকে ঋণ দেয়া সম্ভব হয় না। ফলে সাপ্তাহিক সভায় উপস্থিতি ও অন্যান্য কার্যক্রমে সদস্যদের অংশগ্রহণ কম মনে হয়েছে।

৭) কোন কোন সদস্য একবার ঋণ নেয়ার পর আর সহজে ফেরৎ দেয় না। ঋণ আদায়ে কোন মামলাও করা সম্ভব হয় না। ফলে অনেক সমিতি তারল্য সংকটে পতিত হতে দেখা গেছে।

সম্ভাবনা (Opportunities)

১) গ্রামে সিভিডিপি সমবায় সমিতি 'লিড এজেন্সী' হিসাবে কাজ করছে। এ সমিতিকে কেন্দ্র করে 'রিসোর্স মবিলাইজেশন' করতে পারলে সদস্যদের আর্থ-সামাজিক উন্নয়ন নিশ্চিত করা সম্ভব।

২) অধিকাংশ সমিতি ব্যাংকিং রূপ পরিগ্রহ করার দিকে এগিয়ে যাচ্ছে। এটিকে নিবিড়ভাবে ফলোআপ ও নার্সিং করতে পারলে উচ্চ সুদে ঋণ ব্যবসায়ী ও ঋণ প্রদানকারী সংস্থার হাত থেকে গ্রামবাসীদের রক্ষা করা সম্ভব হবে।

৩) গ্রামভিত্তিক এই সংগঠনের মাধ্যমে গ্রাম থেকে শহরে সম্পদ স্থানান্তর রোধ করে ধীরে ধীরে পুরো গ্রামের সামগ্রিক উন্নয়ন করা সম্ভব হবে।

৪) সদস্যরা অনেক সময় জরুরী ভিত্তিতে ঋণ পেতে চায়। তাদের চাহিদামত ঋণ দিতে গিয়ে ব্যাংকের মাধ্যমে লেনদেন করা সম্ভব হয় না। তাছাড়া সংগৃহীত পুঁজি বা ঋণের কিস্তি ব্যাংকে জমা রেখে আবার জরুরী ঋণ চাহিদা মিটানোর ক্ষেত্রে সমস্যা হয়। আবার সাপ্তাহিক ছুটির দিনে ব্যাংক থেকে টাকা উত্তোলনে অসুবিধা হয় বিধায় তারা নিজেরাই ক্যাশ বহির মাধ্যমে লেনদেন করে থাকে। এ পদ্ধতি কাজ করলে ভাল ফল পাওয়া সম্ভব।

আশংকা (Threats)

১) সমিতিগুলোর ঋণ কার্যক্রম কতটুকু টেকসই হবে তা এত স্বল্প সময়ে নিশ্চিত করে বলা সম্ভব না।

২) প্রচলিত ঋণদানকারী প্রতিষ্ঠানসমূহের সাথে সিভিডিপি সমিতিগুলো প্রতিযোগিতায় টিকে থাকতে পারবে কি-না তা এ মূহুর্তে নিশ্চিত নয়।

৩) ব্যবস্থাপনা কমিটি ঋণ বিতরণে অনেক সময় নিরপেক্ষতা হারিয়ে ফেলে। ফলে সমিতির মধ্যে অস্থিরতা ও দ্বন্দ্ব কাজ করে। এ দ্বন্দ্ব প্রশমন করতে না পারলে সংগঠন হিসাবে টিকে থাকা চ্যালেঞ্জিং হবে।

৪) কোন কোন সমিতি ব্যাংকের মাধ্যমে লেনদেন করে না। দীর্ঘ মেয়াদে এ প্রবণতা হিসাব ব্যবস্থাপনায় নেতিবাচক প্রভাব ফেলতে পারে।

উপরোল্লিখিত বিশ্লেষণ থেকে দেখা যায় যে, সমিতিগুলোর নিজস্ব ঋণ কার্যক্রমের কিছু কিছু দুর্বলতা বা আশংকামূলক দিক থাকলেও দীর্ঘমেয়াদে এটি টেকসই ঋণ কার্যক্রম হিসাবে সদস্যদের কর্মসংস্থান ও আয় বৃদ্ধি তথা স্ব-নির্ভরতা অর্জনে সক্ষম হতে পারে।

ঋণের কার্যকারিতা বৃদ্ধির সুপারিশমালা

১) দেখা গেছে, ঋণ তহবিলের আকার বৃদ্ধি পায়নি। অথচ সাম্প্রতিক সময়ে ঋণের চাহিদা বৃদ্ধি পেয়েছে। আবার উপকরণ ও অন্যান্য ব্যয় বেড়েছে। তাই ঋণ তহবিলের আকার বৃদ্ধি করা আবশ্যক। এ ব্যাপারে সমিতিগুলোকে উদ্বুদ্ধ করতে হবে।

২) বিতরণকৃত ঋণের পরিমাণ প্রয়োজনের তুলনায় কম বলে মনে হয়। কর্মসংস্থান সৃষ্টি ও আয় বৃদ্ধি তথা দারিদ্র বিমোচন কৌশল পত্রের লক্ষ্য অর্জনে বিনিয়োগ বাড়ানো দরকার। এক্ষেত্রে প্রকল্প ঋণের সহায়তা প্রদানের বিষয়টি সক্রিয়ভাবে বিবেচনা করা যেতে পারে।

৩) ক্ষুদ্র ঋণ ব্যবহার করার ফলে অনেকেই নিজেদের সফল উদ্যোক্তা হিসাবে প্রতিষ্ঠিত করেছে। তাদের পরবর্তী ধাপে উত্তরণের জন্য 'SME' স্তরের কারিগরী ও আর্থিক সহায়তা প্রদান একটি জরুরী বিষয়।

৪) সমবায়ীদের অনেকেই বলেছেন, বন্যা, বিদ্যুৎ বিভ্রাট, চিকিৎসা সুবিধার অভাব, গো-খাদ্যের উচ্চমূল্যসহ বিভিন্ন প্রাকৃতিক দূর্যোগের সময় উদ্যোক্তাদের জন্য ঝুঁকি মোকাবিলায় সমিতির সংরক্ষিত ও ক্ষতিপূরণ তহবিলের আকার বৃদ্ধি করা যেতে পারে। ক্ষতিগ্রস্ত উদ্যাক্তাদের 'crisis' কাটিয়ে উঠার জন্য পুনঃঋণ অথবা ঝুঁকি তহবিল থেকে অনুদান দেয়া যেতে পারে।

৫) সমীক্ষায় দেখা গেছে, মুরগী পালন, গরু মোটাতাজাকরণ ও মৎস চাষ লাভজনক ব্যবসায় পরিণত হয়েছে। এক্ষেত্রে বিনিয়োগ বাড়ানো দরকার। সে সাথে ব্রিফেসার প্রশিক্ষণ কোর্সের মাধ্যমে তাদের জ্ঞান ও দক্ষতার পুনঃবৃদ্ধি ঘটানো খুবই জরুরী।

৬) প্রশিক্ষণপ্রাপ্ত মহিলা সদস্যরা হস্তলিল্পের উপর প্রশিক্ষণ নিয়ে শাড়ীর উপর সূচীকর্ম, টুপি সেলাই, বাঁশের কাজ ইত্যাদি কাজে নিয়োজিত। তাদের উৎপাদিত উৎপাদসমুহের বাজারজাতকরণের অসুবিধা পরিলক্ষিত হয়েছে।

৭) বিতরণকৃত ঋণের উপযুক্ত ব্যবহার ব্যাপারে নিবিড় ফলোআপ করা দরকার। অর্থাৎ অন্ততঃ ছয় মাসে একবার ঋণ গ্রহীতাদের ফলোআপ জরীপ করা যেতে পারে। এতে ঋণের খাতওয়ারী ব্যবহার সুনিশ্চিত হবে।

৮) দারিদ্র বিমোচন কৌশলপত্রে বর্ণিত লক্ষ্যসমূহ অর্জন নিশ্চিত করার জন্য একটি সর্বাত্মক দারিদ্র পরিবীক্ষণ পদ্ধতি চালু করার অঙ্গীকার ব্যক্ত করা হয়েছে। দরিদ্রদের জন্য ঋণ দান ও কর্মসংস্থান বিষয়ে পরিবীক্ষণ ব্যবস্থাপনা জোরদার করার জন্য তিনটি পর্যায়ে নিম্নোক্ত সূচকসমূহ পরিমাপ করার উপর গুরুত্ব দেয়া হয়েছে। এর আলোকে সিভিডিপি ঋণ কার্যক্রমের উপর ব্যাপক গবেষনার ভিত্তিতে এর কার্যকারিতা বিশ্লেষণ করার প্রয়োজন রয়েছে।

সারণী- ৩ঃ ক্ষুদ্র ঋণ পরিবীক্ষণের সূচকসমূহ

উপকরণ (ইনপুট) নির্দেশক	উৎপাদন (আউটপুট)/ মধ্যবর্তী নির্দেশক	ফলাফল (আউটকাম) নির্দেশক
• ক্ষুদ্র ঋণ বন্টন (মোট ব্যয়ের শতকরা হার) • এনসিবিসমূহ • বিভিন্ন এনজিও • অন্যান্য ক্ষুদ্র ঋণ প্রদানকারী প্রতিষ্ঠানসমূহ (এমএফআইসমূহ) • সিভিডিপি সমিতিসমূহ • কর্মসংস্থান সৃষ্টির কর্মসূচী (মোট ব্যয়ের শতকরা হার)	• ঋণের পরিমান ও ঋণ গ্রহীতার সংখ্যা • ক্ষুদ্রঋণের আওতাভুক্ত জেলাসমূহ • ক্ষুদ্রঋণ সম্পর্কিত খাত ভিত্তিক বরাদ্দ • ঋণ পরিশোধের হার ও ঋণ প্রদান সংক্রান্ত ব্যয় • কর্মসংস্থান সৃষ্টি (খাত/উপ-খাত, পুরুষ/মহিলা, গ্রাম/শহর ভিত্তিক) • খাত ও জেন্ডারভিত্তিক প্রকৃত মজুরির ওঠানামা	• দক্ষতা উন্নয়ন, কর্মসংস্থানের সুযোগ ও আয়/প্রভাব সৃষ্টিতে সংশ্লিষ্ট নির্দেশকসমূহের উন্নয়ন • স্তর উন্নয়নের হার (নির্দেশক সমূহের অধিকতর উন্নয়ন করা হবে) • খাত/উপ-খাত ভিত্তিক শ্রমের উৎপাদনশীলতা • কর্মসংস্থানের খাতভিত্তিক বন্টন (পুরুষ/ মহিলা, গ্রাম/ শহর ভিত্তিক, ভৌগলিক বিভাজন)

উপসংহার

দেশের সামগ্রিক উন্নয়নে ক্ষুদ্র ঋণের ভূমিকা খুবই গুরুত্বপূর্ণ। সার্বিক গ্রাম উন্নয়ন কর্মসূচীতে প্রশিক্ষণের পাশাপাশি সমিতির সংগৃহীত পুঁজি থেকে ঋণ বিতরণকে কর্মসংস্থান ও আয় বৃদ্ধির হাতিয়ার হিসাবে বিবেচনা করা হয়েছে। স্বল্প আয়, স্বল্প সঞ্চয় ও স্বল্প উৎপাদনের শৃংখল ভাঙ্গতে অধিক হারে বিনিয়োগ দরকার। সিভিডিপি সমিতিগুলো এ ক্ষেত্রে গতিশীল ও অর্থবহ অবদান রাখছে। তবে প্রয়োজনের তুলনায় তা অল্প। অধিকাংশ ক্ষেত্রে তারা প্রাপ্ত ঋণ কাজে লাগাতে সক্ষম হয়েছে। কেউ কেউ নিজেদের দক্ষ উদ্যোক্তা হিসাবে প্রতিষ্ঠিত করতে সক্ষম হয়েছে। আবার তাদের ব্যবসা কর্মসংস্থান সৃষ্টিতেও অবদান রেখেছে। এখন ক্ষুদ্র ঋণ গ্রহীতা থেকে ক্ষুদ্র ও মাঝারী পর্যায়ের উদ্যোক্তা হিসাবে উন্নীত করতে তাদের আর্থিক ও কারিগরী সহায়তা বৃদ্ধি করা দরকার। বেশী বেশী দক্ষতা বৃদ্ধিমূলক প্রশিক্ষণ প্রদানের মাধ্যমে আধুনিক জ্ঞান ও প্রযুক্তি হস্তান্তর হওয়া দরকার। অর্জিত জ্ঞান ও দক্ষতা ব্যবহারে সমিতিগুলো অধিকহারে ঋণ বিতরণ করতে পারে। তবে সমিতিগুলোর ঋণ কার্যক্রম জোরদার করতে প্রকল্প ঋণ সহায়ক শক্তি হিসাবে বিবেচিত হতে পারে। এভাবে সমিতির নিজস্ব তহবিল থেকে ঋণ ও প্রকল্প ঋণ সহায়তা সমিতিগুলোর ঋণ কার্যক্রমকে গতিশীল করবে বলে গভীরভাবে অনুভূত হয়েছে।

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৫। আত্মকর্মসংস্থানে সফল যুবদের কথা (২০০৬), যুব উন্নয়ন অধিদপ্তর, যুব ও ক্রীড়া মন্ত্রণালয়, ঢাকা।

৬। বাংলাদেশ অর্থনৈতিক সমীক্ষা (২০০৬), অর্থ মন্ত্রণালয়, গণপ্রজাতন্ত্রী বাংলাদেশ সরকার, ঢাকা।

৭। বাংলাদেশঃ অর্থনৈতিক প্রবৃদ্ধি, দারিদ্র নিরসন ও সামাজিক উন্নয়নের জাতীয় কৌশল (অর্ন্তবর্তী দারিদ্র নিরসন কৌশলপত্র), (সার সংক্ষেপ), সাধারণ অর্থনীতি বিভাগ, পরিকল্পনা কমিশন, ঢাকা, (২০০৪)।

৮। ক্ষুদ্র ঋণ নীতিমালা (২০০৩), স্থানীয় সরকার, পল্লী উন্নয়ন ও সমবায় মন্ত্রণালয়, পল্লী উন্নয়ন ও সমবায় বিভাগ, ঢাকা।

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