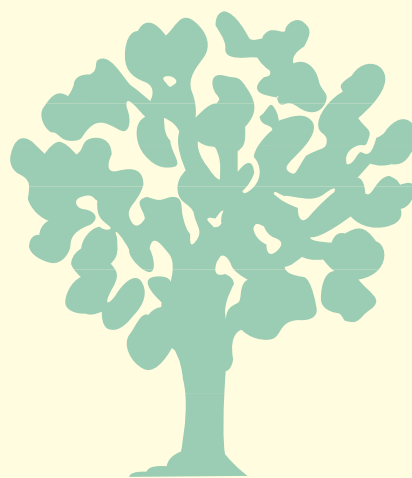# Environmental Literacy and NGOs: Experience from the Microcredit Based Social Forestry Program of *Proshika* in Bangladesh

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Environmental Literacy and NGOs: Experience from the Microcredit Based Social Forestry Program of *Proshika* in Bangladesh

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TABLE OF CONTENTS

LIST OF TABLES

Abstract

This study assesses the impact of participation in the social forestry program of *Proshika* on the environmental literacy of participating households in Bangladesh. *Proshika*--a non-governmental organization--has initiated a social forestry program with the twin objectives of improving environmental quality while alleviating poverty. *Proshika* uses microcredit to motivate poor households to participate in its social forestry program. Moreover, participating households receive training on planting trees along with information on other environmental issues. In order to gauge the impact of the program on the environmental literacy of participating households, we calculated an environmental literacy score on the basis of the responses of households to 10 environmental issues. The analysis relies on a household-level survey of 450 households. We use the instrumental variable technique (IV technique) for the analysis of data. The results indicate that participation in the social forestry program of *Proshika* significantly enhances the environmental literacy of participating households. The findings of the study emphasize the importance of initiating more such programs by the government as well as NGOs to enhance people's knowledge on the environment.

Key Words: Microcredit, Social Forestry, Environmental Literacy, Trees, *Proshika,* Bangladesh.

Environmental Literacy and NGOs: Experience from the Microcredit Based Social Forestry Program of *Proshika* in Bangladesh

M. Jahangir Alam Chowdhury

1. Introduction

The rapid reduction in forest resources has posed a serious threat to the ecological balance of Bangladesh. Currently, natural forest coverage is at 835,000 hectares (excluding parks and sanctuaries), which accounts for just 5.8 percent of the total land area of Bangladesh. Moreover, the per capita forestland, which was 0.035 hectares per person in 1968-69, is at present less than 0.02 hectares (Huq and Alim, 1995). There is a positive correlation between poverty and deforestation. In Bangladesh, approximately 40% of the population live below the poverty line. Poverty contributes significantly to deforestation as poor households are dependent on local forests for their livelihood and for fuelwood. Firstly, the poor do not have the purchasing power to procure firewood from markets. Secondly, the local forest becomes the main source of income, for a large number of poor households, due to lack of employment opportunities and the lack of capital required to start income generating activities. According to studies, deforestation occurs due to the use of fuelwood, fodder and other forest products by local poor people (WCED, 1987; Timberlake, 1985; Anderson and Fishwick, 1984; IUCN, 1980). Thus, poverty becomes one of the main contributors to deforestation and, consequently, to deterioration of the environment.

It is against this backdrop that some non-government organizations (NGOs) in Bangladesh have come forward to improve the environment while alleviating poverty through social forestry programs. Some of these NGOs such as *Proshika* are using microcredit-small collateral-free loans-to motivate poor households to participate in the social forestry program. Social forestry consists of all programs and activities that involve the community in tree planting starting with tree nursery establishment, tree planting on farms and other categories of land, caring for the trees, and the management and utilization of timber and non-timber forest products for a variety of goods and services. Social forestry programs, which primarily aim at helping small farmers and the landless to meet their consumption and income needs while conserving forest resources, provide training to participants on environment and forestry. The main goals are to induce a large number of poor people to plant trees for their own benefit while making them more environmentally literate.

Using the stated objectives of *Proshika* in implementing social forestry programs as its backdrop, this paper assesses the impact on households' environmental literacy of participation in the microcredit-based social forestry program of *Proshika* in Bangladesh. Due to time and financial constraints, the paper looks at only the success of strip and block plantation programs of *Proshika* in achieving its objectives. We determine the environmental literacy status of a household on the basis of the responses of that household to ten questions. The study compares a group of households that participate in the social forestry program (i.e., program group) with a group of households that do not participate in the social forestry program (i.e., comparison group) in order to assess the impact of social forestry participation on the environmental literacy of participating households. Considering the fact of endogeneity in social forestry program participation, we apply the instrumental variable technique (IV technique) to guard against this

effect. The results indicate that participation in social forestry programs significantly enhances the environmental literacy of participating households.

The organization of the paper is as follows. Section two offers a brief discussion of *Proshika* and its social forestry program. Section three outlines the debate so far on environmental literacy. Section four describes the survey design while section five discusses the methodology and the estimation strategy. Section six presents the results while we present conclusions and policy implications in section seven.

2.   *Proshika* and the Social Forestry Program

Proshika, which is one of the four largest microfinance institutions in Bangladesh, began operations in 1976. It envisages a society that is economically productive and equitable, socially just, environmentally sound, and genuinely democratic. The organization's mission is to conduct both extensive and intensive as well as a participatory process of sustainable development through empowerment of the poor. Empowerment makes the poor functionally literate, enabling them to take better care of their health, to get involved in environmental protection and regeneration, and to get elected to local government bodies and community institutions while giving them better access to public and common property resources. Up to December 2004, *Proshika* had mobilized 2.6 million members throughout the country and disbursed a cumulative amount of Taka 20.6 billion.

Forestry has been a key component of the activities of *Proshika* from the beginning. They divide forestry activities into two parts. The first part, which is the Forest Management Program, supports forest protection in degraded *sal* areas and promotes agro-forestry and woodlots in forest areas. But the extent of involvement of *Proshika* in the first part, comparatively speaking, is small because it is present in only six of the four hundred and eighty two *upazilla*[1] in Bangladesh. Social forestry comes under the second part of their forestry program and the activities under this program are comparatively larger than in the case of the forest management program. Currently, *Proshika* operates this program in 150 *upazilla* in 57 districts of Bangladesh. Under the social forestry program, *Proshika* promotes two types of activities: (i) Strip and Block Plantations (ii) Institutional Plantations.

Under the strip and block plantation program, members of *Proshika* plant trees alongside roads, railways, canals or privately owned land. Before starting a strip and block plantation project, *Proshika* helps members of one or two microcredit program groups to negotiate with the owner of the land, who may be a government agency or a private individual. Members work on the plantation only after completion of these negotiations and legal formalities. The members of the groups that are involved in the plantation then select caretakers who are paid to protect the seedlings for the first two to three years when the seedlings are especially at risk from grazing animals. *Proshika*, thereafter, expects the members to protect the trees from theft and to carry out the required maintenance, especially periodic pruning and thinning. In return, these members are allowed to use the biomass produced from trees. At the end, when the trees reach maturity stage, the members involved cut them down to be sold as timber while they divide up the proceeds that come from the sales in agreed proportions among the parties involved in the particular plantation, with *Proshika* members receiving 60%, the landowner 20%, and *Proshika* 20%.

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[1]   Bangladesh divides every district into several administrative regions; each region is known as *Thana*. Currently, the word *Thana* is replaced by the word *Upazilla*. *Upazilla means* sub-district.

During the period from 1976 to 2002, *Proshika* completed 14,671 kilometres of strip plantations with the involvement of 6,729 groups and planted 7.3 million trees (see Table 1). Under the block plantation program, *Proshika* planted some 48.9 million trees on 17,731 hectares of land during the period 1976 to 2002 (see Table 2). *Proshika* was able to involve 8,981 groups of their members in this program.

Proshika carries out its institutional plantation program on the campuses of educational institutions with the objective of creating a more pleasant environment for teachers and students. Sometimes *Proshika* implements such projects as part of joint research with universities and research institutes into newly introduced species. During the period 1998 to 2002, *Proshika* brought 562 institutions within its coverage under the institutional plantation program. *Proshika* was able to plant 472,378 seedlings at these institutions during the said period.

3.   Environmental Literacy

According to Disinger and Roth (1992), Charles E. Roth was the first to use the term 'environmental literacy' in 1968. However, there is no universally acceptable definition of the term even after 40 years. After reviewing the available literature on environmental literacy, Disinger and Roth (1992) therefore state that environmental literacy is based on an ecological paradigm which includes studies of interrelationships between natural and social systems. They also argue that an environmentally literate person combines knowledge with values that translate into actions. For Creighton and Cortese, environmental literacy is "awareness and understanding of the importance of the natural environment and the effects of human activities on it, as well as an appreciation for the complexity of the interaction" (1992: 19). Studies on environmental literacy linked to education and pedagogy have a tendency to define environmental literacy from the perspective of classroom-based environmental education. For example, Hungerford *et al*. (1980) focus on using environmental education curricula to raise environmental literacy.

Roth (2002) has identified what a person should know and understand in order to be considered environmentally literate: (a) the physical processes that shape the patterns of the Earth's surface; (b) the characteristics and spatial distribution of ecosystems on the earth's surface; (c) the characteristics, distribution and migration of human populations on earth; (d) the patterns and networks of economic, social and political interdependence on earth; (e) the processes, patterns, and functions of human settlement; (f) how human actions modify the physical environment; (g) how physical systems affect human systems; (h) the changes that occur in the perception, use, distribution and importance of resources.

Hares *et al*. (2006) conducted a few case studies in Thailand and Sudan in order to understand the role environmental literacy plays in people's ability to interpret endangered sustainability. They define environmental literacy as the perception of people about their physical environment. According to them, while the environmental literacy of a person is shaped by the personal learning process of that person, that learning process depends on the socio-economic, political, cultural, historical, and ecological circumstances which surround that person. In addition to the personal learning process, individual attributes, for example age and intelligence, also determine the level of environmental literacy. They also argue that environmental literacy is not limited to perceptions of individuals about the environment but also includes corresponding environmental behaviour on the part of those individuals. But environmental literacy may not always ensure optimal or appropriate environmental behavior on the part of individuals. Environmentally literate individuals

may pursue activities that harm the environment for the sake of their livelihoods (Hares *et al.*, 2006). Furthermore, environmental behaviour can be influenced by factors other than environmental literacy. These other factors may lead to behaviors that are harmful to the environment on the part of an individual irrespective of his/her environmental literacy. In a study on environmental literacy of secondary school teachers in Taiwan, environmental literacy variables could explain only 35% of the variations in responsible environmental behavior of secondary school teachers. Other factors shaped the remaining 65% of variations in responsible environmental behavior of secondary school teachers. These other factors may be political, cultural or economic (Hsu and Roth, 1998).

Keller (1985) has found ethnic differences when it comes to knowledge on animals and the natural environment of second to eleventh grade students in the United States while Gifford, Hay and Boros (1982-83) have observed gender differences in environmental knowledge among undergraduate students in the United States. Eagles and Muffitt (1990), on the other hand, have reported that media exposure to environmental issues to have a positive effect on environmental knowledge, awareness, concern and attitudes of sixth to eighth grade students in Canada. They conclude that students who watch films and television on wildlife have a more positive attitude toward animals compared to non-viewers. Fortner and Teates (1980), Alaimo and Doran (1980), Hausbeck *et al.* (1992), and Fortner and Mayer (1983) have reported similar findings in their studies.

The terms "environmental perception" and "environmental knowledge" are closely linked to environmental literacy. Whyte (1977) defines environmental perception as the human awareness and understanding of the environment in a general sense of the term. Gambro and Switzky (1996), who conducted a survey on high school students' environmental knowledge in the United States, define environmental knowledge as the ability of students to understand and evaluate the impact of society on the ecosystem. They found the environmental knowledge of high school students to be extremely elementary with the majority of students lacking in understanding regarding the consequences of environmental problems and their ability to offer solutions to those problems.

But the issue of public concern about environmental issues is gradually gaining more scholarly attention due to increasing awareness about climate change. However, the majority of work on public environmental perception has been done in developed countries (Brechin and Kempton, 1994; White and Hunter, 2005). Considering the increasing dependence on natural resources in the developing countries, it is important to study environmental perception among people in developing countries (High and Shakleton, 2000; Twine *et al.*, 2003). Moreover, not only were all the studies that this paper reviewed conducted in developed countries but they considered the issue of environmental literacy from a pedagogical perspective. There is therefore a gap in the literature with regard to the assessment of the impact of participation in environmental projects, especially in social forestry projects, on the environmental literacy of households. The present study fills this gap by assessing the impact of participation in social forestry projects on the environmental literacy of participating households in the case of Bangladesh.

4.   Environmental Literacy Score

Following Roth (2002), in the present study, we ask households to give their opinion on ten environmental issues as a means of gauging their level of environmental literacy. The ten environmental issues are: (i) I do not believe that human being are polluting the environment;

(ii) Dust, smoke from brick fields, and chemical wastage from factories are polluting the environment; (iii) A portion of the pesticide and fertilizer that we use for agricultural purposes remains in food and it is bad for health; (iv) Environmental degradation, especially arsenic contamination, will create a shortage of drinking water in the near future; (v) The incremental use of pesticide and fertilizer reduces product quality; (vi) Environmental problems resulting from agricultural activities are exaggerated by the media; (vii) The use of pesticide and fertilizer in agriculture is causing ground water pollution; (viii) In spite of limitations, farmers can protect the environment; (ix) The use of pesticide and fertilizer is not harmful to the environment; rather they promote high quality production; (x) The governmental and non-governmental organizations will have to become more active in protecting the environment. These ten issues are related to the issues of (a), (b), (e), (f), (g), and (h) that Roth (2002) mentions in his study that we cited in Section 3 above. We have left out only issues related to (c), which refers to migrations of human populations, and (d), which covers the patterns and networks of economic, social and political interdependence on earth (see Roth 2002) in designing questions to understand the environmental literacy of households in Bangladesh. We have not incorporated point (c) because environmental-disaster-induced migration is not a problem in the survey area. We have left out point (d) because of problems in collecting data on socio-political issues.

We asked the sampled households to give their opinion on a 5-point scale, ranging from "strongly agree" to "strongly disagree". On the basis of the households' responses to the above mentioned 10 statements, we calculate an environmental literacy score for each household. In the case of an affirmative statement, we award the highest 5 points to a household whose response is "strongly agree" while we award the lowest 1 point to "strongly disagree". In contrast, we award 5 points to "strongly disagree" and 1 point to "strongly agree" in the case of a negative statement. The highest achievable environmental literacy score for a household is 50 while the lowest achievable environmental literacy score is 10.

5.   Survey Design and Data

We base the analysis reported in this paper on a household-level survey of members of a *Proshika* branch carried out between February and April 2007. The number of households surveyed was 450. We collected the data through face-to-face interviews following a four-stage sampling design. In the first stage, we selected one district, Gazipur, out of the 64 districts in Bangladesh. At the second stage, we selected a branch from the list of branches of *Proshika* in Gazipur. A branch usually consists of some centers, with each center having 30 to 40 members. The selected branch was about 60 km from Dhaka, the capital of Bangladesh. At the third stage, we selected centers from the selected branch. At the fourth and final stage of sampling, we selected individual households. In this randomly selected branch of *Proshika*, the total number of participating households was 6200. Of these 6200 households, only 2100 households participated in social forestry projects. For the purposes of data collection, we divided all the member households of the branch into three categories: (i) households that participated in the microcredit as well as the social forestry program (SF group); (ii) households that participated in the microcredit program but did not participate in the social forestry program (comparison group 1); and (iii) households of new members who had just received their first loan or were awaiting their first loan (comparison group 2) that did not participate in the social forestry program. While we obtained the list of member households from the branch office of *Proshika*, we selected households randomly from the three categories of membership mentioned above. The survey expected 150 questionnaires from each of the three membership categories. However, at some centers, households from the

third category were not available. In case of non-availability of households in the third category of membership, we replaced these households by households from the first and second categories. During the data entry and data cleaning stages, we dropped some observations due to inconsistent responses and missing data which left 420 households in the sample (see Table 2). In the final count, we had 152 households from the social forestry group, 174 households from comparison group 1 (CG1), and 94 households from comparison group 2 (CG2).

Besides information on social forestry and the environment, the survey collected detailed information for all household members on a variety of other factors such as demographic information (age, sex, marital status, etc.) and socio-economic information (education, employment, food consumption, expenditure on health, etc.). We also collected detailed village-level information such as distance to the nearest primary school, secondary school, and market and district headquarters, along with variables describing village infrastructure such as the presence of schools, markets, roads, electricity, etc. Branch officials provided information on the size of the loan received, the date of joining, and other membership characteristics of households.

6.   Estimation Strategy

Keeping in mind the limitations of the simple comparison method, we used the multivariate analysis technique to assess the impact of participation in the social forestry program of *Proshika* on outcome variables at the household level. The main advantage of this technique, compared to the simple comparison method, is that it allows the study to control those household and village level variables that influence the outcomes. Given the extensive geographic coverage of microcredit in Bangladesh, it is difficult to find a perfect 'control' group that we could be used to estimate the impact of microcredit-based social forestry participation on outcome variables.

A household's decision to attend a microcredit-based social forestry program is likely to be related to the outcome of interest, which is environmental literacy, in this paper. We estimate the following equation:

$$Y_i = \beta X_i + \gamma SF_i + U_i \tag{1}$$

where Y is the environmental literacy of households, X is a vector of some control variables that are assumed to be exogenous (for example, education of the household head, the existence of electricity in the household, etc.), and SF is social forestry participation while u is the error term.

The equation given below defines participation in social forestry:

$$SF_i = \delta Z_i + v_i \tag{2}$$

where Z represents some control variables and ? represents the error term of the model. While we estimate the impact of social forestry participation using the equation (1), we assume that the error terms of equations (1) and (2), i.e., u and v, are not correlated. But these two error terms become correlated if the characteristics of households that influence the social forestry program participation decision also determine the outcome variable, i.e., Y in equation (1). In such a situation, the estimation of equation (1) yields a biased estimate of the parameter of interest γ^2.

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[2]   The Wu-Hausman F-test for endogeneity returned a large F-statistics (82.76), indicating that endogeneity is a substantial problem.

Keeping this in mind, we have used the instrumental variable (IV) technique. The IV technique requires at least one variable that is likely to affect the decision to participate in the social forestry program to be incorporated into the model that determines social forestry program participation decision but is unlikely to affect directly the outcome of interest, i.e., environmental literacy (Heckman, 1997). We therefore rewrite the equation (2) under the instrumental variable approach as follows:

$$SF_i = \delta Z_i + \lambda d + v_i \tag{3}$$

where d is the instrumental variable. In order to obtain consistent estimates, we assume that $\lambda \neq 0$ and that d is uncorrelated with u. Considering the geographical locations of social forestry projects and participating households, the distance of the household from the nearest social forestry project could be a good instrument[3]. But since *Proshika* gives priority, with regard to joining, to the nearest households when they implement a social forestry project on a road in a particular area, this distance does not influence the environmental literacy of households. It is possible that some may confuse the distance of a household from the nearest social forestry project with the distance of that household from the nearest paved road. But the distance of the household from the nearest social forestry project is different from the distance of the household from the nearest paved road. As Table 1 shows, households that participate (SF households) in social forestry projects are on average 0.7 km away from the nearest projects. On the other hand, households that do not participate in social forestry projects (Non-SF households) are 1.7 km away from the nearest social forestry projects. It is evident from the t-test that non-SF households are located at a significant distance from the nearest social forestry projects compared to SF households.

In addition to the IV technique, we compared program households (which participate in the microcredit-based social forestry program of *Proshika*) and comparison households (which are only members of the microcredit program of *Proshika* but do not participate in the social forestry program) in terms of the means and the distribution of the outcome variable, i.e., environmental literacy. The differences in the means and the distribution of environmental literacy between program and comparison households capture the impact of participation in the social forestry program of *Proshika* on environmental literacy at the household level.

Considering the potential endogeneity in the participation of households in microcredit-based social forestry projects, we assess the impact of microcredit-based social forestry participation on environmental literacy using a two-stage regression analysis. The first stage regression (equation 3) models the participation decision of households in social forestry projects (SFORESTRY). This model includes X in the right hand side of the model as control variables that influence the participation decision of households along with Z and d. We predict participation in social forestry projects after running the first stage regression.

In the second stage regression, we use the predicted value (PSFORESTRY) of the participation of a household in a social forestry project from the first stage regression as a regressor. Other regressors are: four dummy variables that are related to the employment status of the household head (LABOUR, BUSINESS, AGRI, and SERVICE); eight variables on the number of members of a household in different age groups (MALE6B, FEMALE6B, MALE625, FEMALE625,

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[3]   The F-statistic of the instrument, that is, the distance of the household from the nearest social forestry project, is 235.45. This result indicates that the above-mentioned instrument is a good instrument.

MALE2660, FEMALE2660, MALE60A and FEMALE60A); two variables related to demographic information on household heads (AGE and MALE); two variables that are associated with the education level of the household head and other members (EDUHEAD and EDUALL); one variable related to the religion of the household (MUSLIM); three variables related to local infrastructure (MARKET, SCHOOL, and ELECTRICITY); and one variable related to the membership duration of households in the microcredit program of *Proshika* (MCDUR)[4].

We include four dummy variables related to a household head's employment status, LABOUR, BUSINESS, AGRI and SERVICE, considering OTHERS as the base category, in the model to see their impact on the environmental literacy of households. We include these variables in particular to see whether households with heads involved in agriculture are more environmentally literate compared to heads involved in other professions. We expect households whose heads are involved in agriculture to be more environmentally literate than households whose heads are not involved in agriculture because the former are more likely to experience directly the adverse consequences of environmental phenomena than those in non-agricultural occupations. We have incorporated eight variables (MALE6B, FEMALE6B, MALE625, FEMALE625, MALE2660, FEMALE2660, MALE60A and FEMALE60A), related to the size of a household in terms of age and gender, with the objective of examining their impact on the environmental literacy of a household. We include these eight variables given the different impacts of these variables on the welfare and firm and non-firm activities of a household. We include the age of the household head (AGE) in the model to see how it shapes the level of household environmental literacy.

Studies by Gifford, Hay and Boros (1982-83) and Hausbeck, Milbrath and Enright (1992) have found differences between men and women with regard to environmental knowledge. They point out that men have more environmental knowledge than women. Female-headed households tend to be poorer compared to male-headed households. These households are likely to have less access to education and less access to information as they are less likely to own a radio and TV. Since education and access to a radio and TV are likely to influence environmental education positively; we expect female-headed households to be less environmentally literate compared to male headed households. We therefore include a dummy variable on the sex of the household head (MALE=1 if head is male) in the model. Keller (1985) finds ethnic differences when it comes to the knowledge of second to eleventh grade students in the United States on animals and the natural environment. Taking this into consideration, we have included a dummy variable (MUSLIM=1 if the religion is ISLAM) on the religious status of a household in the model. Furthermore, the education level of the head and other members of the household are likely to affect positively the environmental literacy of a household since formal education provides relevant information on the environment. For this reason, we have included two variables on the education of the head and other members of the household (EDUHEAD and EDUALL) as independent variables on the right hand side of the model.

Access to a local market increases the likelihood of having a higher income by a household as this ensures the availability of inputs for production and increases the marketability of produced goods and services. The higher income enhances the entitlement of household members to education and, thus, increases the possibility of being more environmentally literate. The variable (MARKET) that represents access to a local market is incorporated into the model to control for the effect of this variable on the environmental literacy of households. The availability of a

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[4]   We give the detailed labels of these variables in Table 5.

school in a locality ensures better education for members in that locality and increases the probability of people being more environmentally literate as teachers would teach students about environment-related issues in class. Considering the probable effect of the availability of a school on environmental literacy, we include a variable on the availability of a school (SCHOOL) on the right hand side of the second stage model to control for this effect. The t-test result indicates that new non-social forestry microcredit members (CG2) are significantly more environmentally literate than older non-social forestry microcredit members (CG1). The likely reason for this phenomenon is that new non-social forestry microcredit members are comparatively more dependent on agriculture as is evident from the descriptive results according to which 32% heads of the CG2 households work on their own farm land compared to only 26% heads of the CG1 households. We include membership duration in the microcredit program in the model as an independent variable in order to control for the impact of microcredit program duration on the environmental literacy of households. Since Eagles and Muffitt (1990) have found media exposure to have a positive effect on environmental knowledge, awareness, concern and attitudes of sixth to eighth grade students in Canada, we include an independent variable in the model on the availability of electricity (ELECTRICITY) in the household as a proxy of the household's media exposure. The availability of electricity in a household reflects the higher likelihood of owning a radio and TV by that household.

Since the dependent variable in the second stage regression, that is, the household's environmental literacy score, has count data characteristics, we have applied Poisson regression and negative binomial regression techniques to estimate the determinants of household environmental literacy. We have conducted a test of the over dispersion parameter alpha to examine whether negative binomial regression is a better technique compared to Poisson regression for this model. The test result shows that alpha is significantly different from zero, which indicates that the negative binomial regression is a more appropriate technique for this model. For the purpose of checking the robustness of the results, we report the results of ordinary least squares (OLS) and Tobit regression in addition to the results of the negative binomial regression and Poisson regression.

7.   Results and Discussion

Table 3 presents the distribution of the responses of households on the ten environmental issues. It shows that a higher number of social forestry (SF) households give environmentally logical responses compared to non-social forestry (CG) households. The chi-square test results indicate that the distribution of the responses of SF households is significantly different from that of non-social forestry households. These results indicate that, on the whole, participation in the SF program enhances the environmental knowledge of households and enables households to give more environmentally logical responses to the questions related to environment.

Table 4 shows the total environmental literacy score by household groups. It indicates that the average literacy scores of non-social forestry household groups are 28 and 32 for CG1 and CG2 respectively. On the other hand, the average literacy score of the social forestry household group (SF households) is 36. On average, the SF households have a 29% higher environmental literacy score compared to the CG1 households and a 12% higher score compared to the CG2 households. The t-test results indicate that SF households, on average, have a significantly higher environmental literacy score compared to the two non-social forestry household groups (CG1 and CG2). The average literacy score of all non-social forestry households is 29 (after combining the scores for both the groups). This average literacy score of comparison households is 18%

lower than that of social forestry households while the difference is statistically significant. These results illustrate that participation in social forestry projects is likely to enhance the level of environmental literacy of participating households.

Table 5 shows the environmental literacy score of households by sex of the household head. Female-headed households have an average environmental literacy score of 33 while the score of male households is 32. But the difference between female-headed households and male-headed households in terms of environmental literacy is not statistically significant. This result indicates that female-headed households are likely to have a slightly better knowledge about their surrounding environment compared to male-headed households. This finding contradicts the findings of Gifford, Hay and Boros (1982-83) and Hausbeck, Milbrath and Enright (1992) who found men to be more environmentally knowledgeable than women.

We expect education to have a positive impact on environmental literacy as education helps individuals to learn more about the environment. Table 6 illustrates the environmental literacy score of households by the literacy status of the household head. We define literacy as the ability of a person to read and write. The results indicate that households with literate heads have a 2 points higher environmental literacy score on average than households with illiterate heads. The average environmental literacy score of households with literate household heads is 33 while the same score for households with illiterate heads is 31. The t-test result indicates that households with literate heads have a significantly higher environmental literacy score compared to households with illiterate household heads. These results show education to have a positive impact on the environmental literacy of households.

Table 7 gives the environmental literacy score of households by religion. The average environmental literacy score of Hindu households is 34 while the average environmental literacy score of Muslim households is 30. It shows that households that identify themselves as Hindu, though a minority in Bangladesh, have significantly higher environmental literacy scores compared to households that identify themselves as Muslim, which represent the majority. One reason might be that Hindu households are more educated and therefore more knowledgeable about the environment compared to Muslim households. This finding is similar to that of Keller (1985) who reported ethnic differences in knowledge when it comes to animals and the natural environment among second to eleventh grade students in the United States.

The availability of electricity in a household increases the probability of the household owning a radio and television. Access to radio and television enables household members to watch environment-related programs on television and to listen to environmental programs on radio, both of which would enhance the environmental knowledge of household members. The results on Table 8 show that households with electricity have a slightly higher average environmental literacy score compared to those households without access to electricity. The average environmental literacy score of households with electricity is 32 whereas the average environmental literacy score of households without electricity is 30. The difference in the environmental literacy score of households with and without electricity is statistically significant. This result confirms the findings of Eagles and Muffitt (1990) and Fortner and Teates (1980). Eagles and Muffitt (1990) found that watching films and television significantly enhanced the positive attitudes of children in grades six to eight in Canada towards animals. Fortner and Teates (1980) found that the knowledge of individuals on the oceans was directly affected by the number of Cousteau programs that they had watched on television.

7.1 First Stage Regression

In the first stage regression, we used the probit model since the dependent variable (SFORESTRY) is a binary variable where a household takes the value of 1 if it participates in a social forestry project and 0 otherwise. The results on Table 6 show that the instrumental variable SFDISTANCE, i.e., the distance of a household from the nearest social forestry project, negatively determines the decision of a household to participate in a social forestry project. This result indicates that an increase in the distance of a household from the nearest social forestry project reduces the probability of that household joining a social forestry project. The coefficient of the instrumental variable is statistically significant and the F statistics (F statistics = 235.45) indicate that it is significantly different from zero ($\lambda \neq 0$). These results indicate that the probability of joining a social forestry project by a household reduces by 51% if the distance of that household from the nearest social forestry project goes up by 1 kilometre. This result demonstrates that the ability of the instrument to predict the participation of households in social forestry projects is quite good.

7.2 Determinants of Household Environmental Literacy

Table 7 gives the determinants of the household environmental literacy score. As mentioned in Section 6, the most appropriate technique for estimating the determinants of household environmental literacy is the negative binomial regression. Table 7 also presents the results of the ordinary least squares regression, the Tobit regression, and the Poisson regression in addition to the results of the negative binomial regression. The results from the negative binomial regression indicate that five variables significantly determine the household environmental literacy score. These variables are: the predicated value of social forestry participation from the first stage regression (PSFORESTRY), education of the household head (EDUHEAD), existence of a school in the village (SCHOOL), availability of electricity in the village (ELECTRICITY), and microcredit program membership duration (MCDUR). These results are quite robust because in the other three models too these five variables are statistically significant with the same signs.

Predictably, participation in the social forestry program of *Proshika* (PSFORESTRY) appears significant and positive for the environmental literacy score. This means that participating households are more environmentally literate compared to non-participating households, the probable reason being that participating households receive training from *Proshika* on social forestry and environmental issues which would make them more environmentally literate. This result confirms that participation of households in the social forestry projects of *Proshika* significantly enhances the environmental literacy of households.

The level of education of the household head (EDUHEAD) is significant in terms of the environmental literacy score of households. Education influences the environmental literacy score positively and significantly. In fact, the environmental literacy score of the household rises with the educational level of the household head. Similarly, the education level of all members in the household except the household head (EDUALL) also positively influences the environmental literacy scores of households. But it is not statistically significant. The existence of a school in the locality (SCHOOL) also significantly and positively determines household environmental literacy. The average level of household environmental literacy goes up with the existence of a school in the locality, the likely reason being that the availability of a school in the locality increases the likelihood of local people receiving a formal education at school. These results are logical and expected. Studies have shown that education enhances people's awareness about the environment

since school textbooks contain information about the environment while a literate person also acquires the ability to read newspapers and magazines which carry articles on the environment.

The availability of electricity (ELECTRICITY) in a household is a significant positive determinant of the environmental literacy score of that household. Electricity increases the probability of owning a radio and television by that household. The ownership of radio and television, in turn, gives a household access to better information on the environment. In Bangladesh, radio stations and television channels broadcast programs on the environment on a regular basis in order to make people more aware of environmental issues. Perhaps due to this reason, the existence of electricity in a household significantly increases the environmental score of that household. The dummy variable on the sex of the household head (MALE=1 if household head is male) negatively determines the environmental literacy of households. This means that households with male heads are likely to have a lower environmental literacy score compared to households whose heads are female. But it is not statistically significant. Similarly, the dummy variable on the religious status of a household (MUSLIM=1 if the household identifies itself as Muslim) is a negative determinant of the household's environmental literacy. Households that are Muslim are likely to have a lower environmental literacy score compared to households that identify themselves as Hindu. Like the variable on the sex of the household head, this variable too is statistically insignificant.

The duration of membership of a household (MCDUR) in the microcredit program of *Proshika* significantly and negatively determines the environmental literacy of that household. This result shows new microcredit program households to be more environmentally literate than older microcredit program households, the likely reason being that new microcredit program households are more dependent on agriculture compared to older microcredit program households. The descriptive statistics indicate more heads of new microcredit program households to be employed in the agriculture sector compared to heads of older microcredit program households. The involvement in agriculture makes them more environmentally literate compared to older microcredit program households because agriculture-dependent households have to contend with the negative fall-outs of environmental changes on a more immediate basis than non-agriculture households.

8. Conclusions and Policy Implications

The rapid reduction in forest resources has created serious ecological threats in Bangladesh. The per capita forestland has come down to less than 0.02 hectares from 0.035 hectares per person in 1968-69. Taking into consideration the massive deforestation in Bangladesh as well as the negative consequences of climate change, it is important for policy makers and non-government organizations (NGOs) to undertake projects that motivate people to plant more trees and to conserve existing forest land. It is also important for policy makers and the NGOs to ensure that people become more knowledgeable about environmental issues and the negative fall-outs of adverse environmental changes such as global warming and climate change. *Proshika*, an NGO in Bangladesh, has initiated its social forestry project with the objective of improving the environment while alleviating poverty, which is one major cause of deforestation. The main goal is to encourage poor people to plant trees for their own benefit. Besides encouraging participating households to join tree planting projects, *Proshika* provides training to these households about the environment and the importance of planting trees for the purpose of deriving both economic and environmental benefits. Therefore, it is only natural that participating households would have a better knowledge on the environment than non-participating households. It is against this backdrop that the present

study has evaluated the impact on the environmental literacy of households of participation in the social forestry projects of *Proshika*.

We have defined environmental literacy as knowledge and understanding among individuals about the factors and issues related to environment and how environmental factors affect the quality of life of individuals. We have calculated an environmental literacy score on the basis of the responses of households to ten environmental issues on a 5-point scale ranging from "strongly agree" to "strongly disagree" for every responding household. The highest achievable environmental literacy score is 50 and the lowest achievable environmental literacy score is 10 for each participating household.

We base the analysis on a household-level survey of 450 households. Considering the fact of endogeneity in program participation, we used the instrumental variable (IV) technique to achieve the objectives of the study. Considering the count data characteristics of environmental literacy, we considered negative binomial regression to be the appropriate technique for assessing the impact on the environmental literacy of households of participation in the social forestry projects of *Proshika*. The results indicate that participation in the social forestry program of *Proshika* significantly enhances the environmental literacy of participating households. These findings demonstrate the importance of policy makers and NGOs initiating more environment-related projects like social forestry to make people more literate about the environment. Besides initiating such projects, the government must take steps to increase the access of people to education and to the media, such as radio and TV, as these appear to be significant positive determinants of the environmental literacy of households.

9. Acknowledgements

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LIST of TABLES

Table 1: Social Forestry Program of *Proshika*

Types of Plantation	Period	No. of Seedlings Planted	Area	No. of Groups /Institutions Involved
Strip	1976 - 2002	7, 346, 269	14, 671 kilometres	6,729 Groups
Block	1976 - 2002	48,915,016	17,731 hectares	8,981 Groups
Institutional	1998 - 2002	472,378	-	552 Institutions

Source: Annual reports of Proshika

Table 2: Sample Distribution

Household Groups	Frequency	Percent	Cumulative Percent
SFG	152	36.19	36.19
CG1	174	41.43	77.62
CG2	94	22.38	100.00
Total	420	100.00	

Source: Field survey, 2007
SFG = Social Forestry Group; CG1 = Comparison Group 1, households (HHs) with *Proshika* membership more than 1 year belong to this group; CG2 = Comparison Group 2, new member households belong to this group.

Table 3: Distribution of the Responses of Households on Environmental Issues (%)

Environmental Issues	Groups	Strongly Agree	Agree	Indifferent	Disagree	Strongly Disagree	Chi Square
I do not believe that human being are polluting the environment	SF	16.56	21.85	1.99	25.83	33.71	144.29*
	Non SF	36.02	9.96	39.85	9.58	4.60	
Dust, smoke from brick fields, and chemical wastage from factories are polluting the environment	SF	58.94	36.42	1.32	2.65	0.66	65.26*
	Non SF	25.29	42.91	1.15	11.88	18.77	
A portion of the pesticide and fertilizer that we use for agricultural purposes remains in food and it is bad for health	SF	49.67	38.41	5.30	5.30	1.32	76.60*
	Non SF	16.86	33.72	16.48	13.41	19.54	
Environmental degradation, especially arsenic contamination, will create a shortage of drinking water in the near future	SF	56.95	32.45	4.64	4.64	1.32	56.39*
	Non SF	29.12	28.35	5.75	16.86	19.92	
The incremental use of pesticide and fertilizer reduces the product quality	SF	44.37	33.77	6.62	11.92	3.31	56.93*
	Non SF	19.16	24.90	20.69	14.56	20.69	
Environmental problems resulting from agricultural activities are exaggerated by the media	SF	11.26	15.89	25.17	14.57	33.11	94.17*
	Non SF	32.18	35.25	18.77	10.73	3.07	
The use of pesticide and fertilizer in agriculture is causing ground water pollution	SF	52.32	35.76	5.30	3.97	2.65	78.86*
	Non SF	16.48	36.40	9.58	17.24	20.31	
In spite of limitations, farmers can protect the environment	SF	48.34	29.14	12.58	7.95	1.99	68.14*
	Non SF	15.71	29.89	16.86	16.09	21.46	
The use of pesticide and fertilizer is not harmful to the environment; rather they promote high quality production	SF	9.27	24.50	12.58	18.54	35.10	76.55*
	Non SF	28.35	38.31	15.33	12.64	5.36	
The governmental and non-governmental organizations will have to become more active in protecting the environment	SF	68.21	27.81	0.00	3.31	0.66	67.54*
	Non SF	37.55	22.22	8.43	14.56	17.24	

Source: Field survey, 2007; * Significant at 1% level.

Table 4:   Environmental Literacy Score

(by Social Forestry Participation and other Household Characteristics)

Classification Criteria	Household Groups	No. of Obs	Mean	Std. Dev	t-test	
					T	Pr(|T\> |t|)
SF participation	CG1	173	27.77	6.85	11.72	0.0000
	SFG	150	35.70	5.01		
SF participation	CG2	87	31.94	3.37	6.23	0.0000
	SFG	150	35.70	5.01		
SF participation	CG1 & CG2	260	29.17	6.22	10.96	0.0000
	SFG	150	35.70	5.01		
HH head's sex	Female	23	32.78	7.49	0.91	0.3630
	Male	387	31.48	6.55		
HH head's literacy	Literate	230	32.49	6.31	3.28	0.0011
	Illiterate	180	30.36	6.79		
HH's religion	Hindu	15	35.38	8.41	2.30	0.0222
	Muslim	395	31.41	6.50		
HH's access to electricity	Without Electricity	69	29.72	6.09	2.54	0.0113
	With Electricity	341	31.92	6.65		

Source: Field survey, 2007; SFG = Social Forestry Group; CG1 = Comparison Group 1, households (HHs) with *Proshika* membership more than 1 year belong to this group; CG2 = Comparison Group 2, new member households belong to this group.

Table 5:   Variables Definition and Descriptive Statistics

Variable	Definition	Mean	Standard Deviation
SFORESTRY	Dummy for the Social Forestry (SF) Participation, 1 if the household participates in the SF project, 0 otherwise	0.36	-
ENVSCORE	Total household environmental score	30.29	6.29
SFDISTANCE	Distance to the nearest social forestry project (kilometres) from the house	1.28	0.96
MUSLIM	Dummy for the religion of the household, 1 if the household is Muslim, 0 if the household is Hindu	0.96	
MARKET	Distance of the household from the nearest market (kilometres)	0.65	0.59
SCHOOL	Distance of the household from the primary school (kilometres)	0.48	0.41
ELECTRICITY	Dummy for the availability of electricity in the village; 1 if the village has electricity, 0 otherwise	0.83	-
MALE	Dummy for the sex of the household head; 1 if head is a male, 0 otherwise	0.95	0.23
EDUHEAD	Total years of schooling of the household head	3.75	4.19
AGE	Age of the household head (in months)	543.08	150.55
LABOUR	Dummy for the employment of the household head - daily labour, 1 if head is a daily labourer, 0 otherwise	0.14	-
BUSINESS	Dummy for the employment of the household head - business, 1 if head is a businessmen, 0 otherwise	0.23	-
AGRI	Dummy for the employment of the household head, 1 if head is a farmer, 0 otherwise	0.35	-
SERVICE	Dummy for the employment of the household head - service, 1 if head is a service holder, 0 otherwise	0.12	-
MALE6B	Total male household members in the age category of 6 below	0.17	0.42
FEMALE6B	Total female household members in the age category of 6 below	0.14	0.38
MALE625	Total household male members in the age category of 6 to 25	1.07	0.95
FEMALE625	Total household female members in the age category of 6 to 25	1.02	0.95
MALE2660	Total household male members in the age category of 26 to 60	1.02	0.72
FEMALE2660	Total household female members in the age category of 26 to 60	0.79	0.62
MALE60A	Total household male members in the age category of 60 above	0.06	0.24
FEMALE60A	Total household female members in the age category of 60 above	0.01	0.11
EDUALL	Total years of schooling of all household members except the household head	14.13	11.74
MCDUR	Duration of membership in the social forestry program (in months)	3.98	6.22

Source: Field survey, 2007

Table 6:   Determinants of Household Participation in Social Forestry Projects (probit)

Variables	coefficient	SE	dy/dx
	(1)	(2)	(3)
SFDISTANCE	-1.913***	(0.170)	-0.507
MUSLIM	-1.084**	(0.544)	-0.383
MARKET	0.0514	(0.187)	0.014
SCHOOL	-0.451	(0.281)	-0.120
ELECTRICITY	-0.443*	(0.257)	-0.132
AGE	0.00145*	(0.0008)	0.0004
MALE	-0.236	(0.519)	-0.068
EDUHEAD	0.00833	(0.0292)	0.002
LABOUR	0.404	(0.379)	0.120
BUSINESS	0.0136	(0.324)	0.004
AGRI	0.358	(0.313)	0.099
SERVICE	-0.0943	(0.403)	-0.024
EDUALL	-0.0229*	(0.014)	-0.006
MALE6B	-0.136	(0.229)	-0.036
FEMALE6B	-0.00606	(0.258)	-0.002
MALE625	0.0316	(0.122)	0.008
FEMALE625	0.369***	(0.126)	0.098
MALE2660	0.0616	(0.162)	0.016
FEMALE2660	0.187	(0.202)	0.050
MALE60A	0.323	(0.439)	0.086
FEMALE60A	0.362	(0.909)	0.110
MCDUR	0.00491***	(0.001)	0.001
Constant	1.459*	(0.886)	
Log likelihood	**322.04**		
Pseudo R2	**0.5936**		
Obs	**412**		

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7:   Determinants of the Environmental Literacy Score

Variables	Coefficients (1)	SE (2)	Coefficients (3)	SE (4)	Coefficients (5)	SE (6)	Coefficients (7)	SE (8)
PSFORESTRY	9.460***	(0.952)	9.437***	(0.931)	0.301***	(0.029)	0.302***	(0.030)
MUSLIM	-1.427	(1.596)	-1.439	(1.561)	-0.0359	(0.046)	-0.0359	(0.047)
MARKET	0.0871	(0.567)	0.0937	(0.555)	0.00208	(0.017)	0.00208	(0.017)
SCHOOL	1.444*	(0.826)	1.470*	(0.809)	0.0464*	(0.025)	0.0464*	(0.026)
ELECTRICITY	2.816***	(0.809)	2.806***	(0.791)	0.0910***	(0.025)	0.0911***	(0.026)
AGE	0.00320	(0.003)	0.00305	(0.003)	9.97e-05	(7.9e-05)	9.98e-05	(7.8e-05)
MALE	-2.172	(1.481)	-2.216	(1.449)	-0.0689	(0.045)	-0.0690	(0.045)
EDUHEAD	0.216**	(0.088)	0.214**	(0.086)	0.00681**	(0.003)	0.00684**	(0.003)
LABOUR	0.751	(1.112)	0.739	(1.088)	0.0229	(0.034)	0.0230	(0.034)
BUSINESS	0.676	(0.968)	0.637	(0.947)	0.0227	(0.030)	0.0228	(0.030)
AGRI	0.442	(0.956)	0.449	(0.935)	0.0144	(0.030)	0.0146	(0.030)
SERVICE	1.002	(1.146)	1.011	(1.121)	0.0338	(0.035)	0.0337	(0.035)
EDUALL	0.0410	(0.041)	0.0405	(0.040)	0.00132	(0.001)	0.00131	(0.001)
MALE6B	0.651	(0.728)	0.685	(0.713)	0.0212	(0.022)	0.0211	(0.023)
FEMALE6B	0.334	(0.791)	0.343	(0.774)	0.0113	(0.024)	0.0112	(0.024)
MALE625	-0.00251	(0.366)	-0.00378	(0.358)	8.13e-05	(0.011)	0.000111	(0.011)
FEMALE625	-0.00138	(0.390)	0.00167	(0.382)	-0.000123	(0.012)	-3.30e-05	(0.012)
MALE2660	-0.753	(0.510)	-0.738	(0.499)	-0.0243	(0.016)	-0.0242	(0.016)
FEMALE2660	-0.413	(0.596)	-0.373	(0.583)	-0.0132	(0.018)	-0.0131	(0.018)
MALE60A	-1.988	(1.447)	-1.943	(1.415)	-0.0639	(0.044)	-0.0639	(0.045)
FEMALE60A	-0.109	(2.588)	-0.0945	(2.531)	-0.00258	(0.080)	-0.00241	(0.080)
MCDUR	-0.0196***	(0.004)	-0.0194***	(0.003)	-0.000639***	(0.0001)	-0.000641***	(0.0001)
Constant	28.04***	(2.718)	28.12***	(2.659)	3.326***	(0.0814)	3.326***	(0.082)
Log likelihood			**-1284.0458**		**-1296.9876**		**-1296.9278**	
R2/Pseudo R2	**0.267**		**0.0462**		**0.0551**		**0.0459**	
Obs	**408**		**408**		**408**		**408**	

Standard errors in parentheses. OLS=Ordinary Least Square, Poisson=Poisson Regression and NBReg=Negative Binomial Regression. ** p<0.01, ** p<0.05, * p<0.1

Annexure

University of Dhaka
Center for Microfinance and Development

Study on
Micro-Credit Based Social Forestry in Bangladesh

Questionnaire

Questionnaire ID	

Study on
Micro-Credit Based Social Forestry in Bangladesh

ID

Name of the Respondent: _____.

Village Name: _____.

Thana: _____.

District: _____.

Name of the Interviewer: _____.

Date of the Interview: _____.

Religion(code): _____.
Code: 1=Islam, 2=Hindu and 3=Others

1.8.   Local Information:

	Have?Code: 1 = Yes, 2 = No		Distance from the Household	
	Code	**Yes/No Code**	**Code**	**Distance (in km)**
Market	V18A01		V18B01	
Pitched road	V18A02		V18B02	
Primary School	V18A03		V18B03	
School	V18A04		V18B04	
College	V18A05		V18B05	
Madrasa (Religious School)	V18A06		V18B06	
Bank	V18A07		V18B07	
Hospital	V18A08		V18B08	
Shop	V18A09		V18B09	
Thana Headquarter	V18A10	-	V18B10	
Deep Tube-well	V18A11		V18B11	
Electricity	V18A12		V18B12	
Maktab (Informal School)	V18A13		V18B13	
School of NGOs	V18A14		V18B14	
District Headquarter	V18A15	-	V18B15	
India-Bangladesh Boarder	V18A16	-	V18B16	
Dhaka	V18A17	-	V18A17	

2.1   General information about the NGO membership of the respondent (Male):

Serial No.	Name	Status Code	Sex	Age Year	Months	Total Months	Education (total years)	Current status (code)	Information about Child — Number of children Boy	Girl	Age of the eldest child	Institution (code)
V2MSL		V2MHS	V2SX	V2MAG			V2MEDU	V2MM	-	-	-	V2MINS
									-	-	-	
									-	-	-	
									-	-	-	
									-	-	-	
									-	-	-	
									-	-	-	

2.1.1.   General information about the NGO membership of the respondent (Female):

Serial No.	Name	Status Code	Sex	Age			Education (total years)	Marital status (code)			Information about Child			Institution (code)
				Year	Months	Total Months		Current status (code)	Husband (Code)	Age of husband	Number of children		Age of the youngest child	
											Boy	Girl		
V2FSL		V2FHS	V2SX	V2FAG			V2FEDU	V2FM	V2FHU	V2FHA	V2FCM	V2FCF	V2FCY	V2FINS

-**Household Status (code):** 1 = Household head, 2= Wife of household head 3= programme member, 4 = general member-**Sex Code:** 1 = Male and 0 =Female-**Education**= Total how many years has the person studied?

-**Marital status**
-**Current status code:** 1 = Married and 2 = Unmarried, 3 = Divorcee and 4 = Wife/husband died
- **Husband? Code:** 1 = Yes, 0 = No
-**Institution Code:** 1 = General educational Institution, 2 = Madrasa, 3 = NGO school/Maktab

General Information about the members:

Member of the family	Status of employment after membership		Status of employment before membership	
	Employment Code	Occupation Code	Employment Code	Occupation Code
Head of the household	V22AHHE	V22AHHO	V22BHHE	V22BHHO
Member of the NGO	V22APME	V22PMO	V22BPME	V22BPMO
Husband/ Wife of the member of the NGO	V22APSE	V22APSO	V22BPSE	V22BPSO

Employment code: 1 = Service, 2 = Self-employment, 3 = Unemployed, 99 = Not applicable, (0-15 year old)
Occupation Code: 1 = Day-labor, 2 = Business, 3 =Cultivation, 4 = Service holder, 5 = Others

Information about Participating in the microcredit project of the NGO

	Months	Years		Total months

When did you become member?   V231

When did you get first loan?   V232

2.3.3What is the amount of last loan (in Taka)?   V233

2.3.4 Apart from you is anyone else from your family a member of this NGO?   V234
Code: 1= Yes and 0= No

Apart from you, how many members of your family take loan from different NGOs?   V235

How much loan has been taken by these family members (in Taka)?   V236

3.0.   **Assets and liabilities**

     Agricultural Assets (Before Membership):

	Currently Owned		Share Cropped		Lease/Rent	
	Size	Value	Size	Value	Size	Value
Irrigated	V311L1A	V311L1P	V311L3A	V311L3P	V311L5A	V311L5P
Non Irrigated	V311L2A	V311L2P	V311L4A	V311L4P	V311L6A	V311L6P

Agricultural Assets (Current Position):

	Currently Owned		Share Cropped		Lease/Rent	
	Size	**Value**	**Size**	**Value**	**Size**	**Value**
Irrigated	V312L1A	V312L1P	V312L3A	V312L3P	V312L5A	V312L5P
Non Irrigated	V312L2A	V312L2P	V312L4A	V312L4P	V312L6A	V312L6P

3.2. Assets and Liabilities: Other Assets:

Assets Description	During membership	
		Present Value
1. Productive Assets	V3210	
1.1. Large Farm Animals (owned or Shared)	V3211	
1.2. Fruit Gardens	V3212	
1.3. Building, Machinery and Equipment (used/ not used)	V3213	
1.4. Fishing Boat and/or Engine and Net	V3214	
1.5. Stalls or store(overall valuation of the present goods)	V3215	
1.6. Any other Productive Assets (see the descriptions and code below the table)		
2. House Assets	V3220	
2.1. House Plot	V3221	
2.2. House	V3222	
2.3. Major Consumer Goods (Especially Vehicles from House Index)	V3223	
3. Financial Assets	V3230	
3.1. Life insurance policy	V3231	
3.2 Savings (Programme)	V3232	
3.3. Savings (Non-programme)	V3233	
3.4 Jewelry/Gold	V3234	
3.5. Any other non-productive Assets(see the descriptions and code below the table)		

Code

-Other productive assets': 1= Trees, 2= providing loan, 3= Rickshaw/Van, 4= Boat, 5=Tubewell, 6= Deep tubewell, 7=Fishing net, 8= paddy threshing machine (diesel), 9= Paddy threshing machine (electricity), 10=Handloom, 11=Plough, 12=Ladder, 13=Power tiller, 14= Saw 15= duck/hen,16= others

-Other unproductive assets': 1=Radio/ television, 2=Cycle, 3= Motorcycle

3.3   Assets and Liabilities: Liabilities

		Present Value
Liabilities	V330	
1. Debts with Financial Institutions	V331	
2. Debts with Informal Money lenders	V332	
3 Large Debts with Friends, Relatives (Cash or Kinds)	V333	
4. Debts with Suppliers / Wholesalers	V334	
5. Any Other Financial Obligation That Can Be Financially Valued		

3.4   Assets: Estimated market value of house

V34	

3.5   Assets and Liabilities: Sources of Capital of business

Sources	Before Membership Amount of Capital		Current Position Amount of Capital	
Own Source	V35A1		V35B1	
External Sources	V35A2		V35B2	

4.0.   Income and Consumption:

4.1.1.   Income in last 1 year

Sources of Income	Production Cost	Quantity	Value	Quantity	Value	Total Production	Income
Paddy/Wheat							
Lentils							
Vegetables							
Milk							
Egg							
Fish							
Poultry							
Cattle							
Other Agri-products							
Total						V411	

4.1.2. Others Income

Sources of Income	Income in last 1 year
Daily Labour/Rickshaw pulling	
Salary	
Income from Shop	
Business	
Remittance from other family members	
Others	

Total	V412	

4.1.3 Profit gained from the investment of microcredit:

	During last one month		During last one year	
Income from microcredit	V413M		V413Y	

4.1.4 When income is low, it is rational to buy food for the family by loan, do you agree? Code: 1= Yes and 0= No

V414	

4.1.5. Is your current income consistent with your expectation? Code: 1=more than expectation, 2= consistent with expectation, 3= less than expectation

V415	

4.2 Income and expenditure: expenditure

4.2.1. Number of household members took meal in last 24 hours

Member	Below 10 years		Equal to or more than 10 years	
	Total numbers		Total numbers	
Female	V421AF		V421BF	
Male	V421AM		V421BM	

4.2.2. Quantity and value of food consumption in last one week:

Items	Quantity	Price according to sources(Taka)					Total Taka
		Purchase	Own Production	Gift			
Rice Related						**C10**	
Rice						C11	
Flour						C12	
Muri/chira/khoi						C13	
Shemai/shuji						C14	
Bread/ Loaf						C15	
Biscuit						C16	
Others(Please mention)							
Lentiles Related						**C20**	
Kheshari						C21	
Mashur						C22	
Mug/Kalai						C23	
Motor/Boot						C24	
Others(Please mention)							
Fish:						**C30**	
Big Fish						C31	
Medium fish						C32	
Small Fish						C33	
Dried Fish						C34	
Sea Fish						C35	
Egg:						**C40**	
Hen/Duck						C41	
Meat:						**C50**	
Beef						C51	
Mutton/Lamb						C52	
Chicken/Duck						C53	
Others(Please mention)							

Items	Quantity	Price according to sources(Taka)					Total Taka
		Purchase	Own Production	Gift			
Vegetables						**C60**	
Aubergine						C61	
Kumra						C62	
Lau						C63	
Potato						C64	
Kachu/Kachur Lati						C65	
Karala						C66	
Patal						C67	
Chichinga/jhinga						C68	
Dhundul						**C69**	
Green Banana						C70	
Sweet Potato						C71	
Cauliflower						C72	
Bhada Kafi						C73	
Barbati						C74	
Tomato						C75	
Tharash						C76	
Others(Please mention)							
Spinach						**C80**	
Lal Shak						C81	
Pui Shak						C82	
Kachu Shak						C83	
Lau Shak						C84	
Kumra Shak						C85	
Mula Shak						C86	
Palon Shak						C87	
Data Shak						C88	
Pachmishali Shak						C89	
Others(Please mention)							

Items	Quantity	Price according to sources(Taka)					Total Taka
		Purchase	Own Production	Gift			
Milk						**C100**	
Liquid /Packet milk (cow, goat, buffalo)						C101	
Powder Milk						C102	
Casein/Curd						C103	
Butter milk						C104	
Others(Please mention)							
Sweetmeat						**C110**	
Roshgolla/Kalajam						C111	
Jilapi/Amriti/Kunda						**C112**	
Badasha/Kadma						C113	
Sugar/Gur/Misri						C114	
Ice-cream						C115	
Gaja/Khaja						C116	
Others(Please mention)							
Oil						**C120**	
Mustard Oil						C121	
Soybean						C122	
Ghee/Dalda						C123	
Others(Please mention)							
Spices						**C130**	
Green Chili						C131	
Dried Chili						C132	
Onions						C133	
Garlic						C134	
Turmeric						C135	
Salt						C136	
Others(Please mention)							

Items	Quantity	Price according to sources(Taka)				Total Taka
		Purchase	Own Production	Gift		
Fruit					**C140**	
Coconut					C141	
Banana					C142	
Papaya					C143	
Guava					C144	
Pineapple					C145	
Boroi, tamarind					C146	
Hog-plum/ kamranga					C147	
Others(Please mention)						
Drinks					**C150**	
Tea					C151	
Coke/Pepsi					C152	
Others(Please mention)						
Battle Leaves/Tobacco					**C160**	
Battle Leaves					C161	
Tobacco Leaves					C162	
Tobacco Leaves					C163	
Tamak					C164	
Gul					C165	
Others(Please mention)						
Other expenditure					**C170**	
Puri/ Piazu					C171	
Curd/ Sandesh					C172	
Battle leaf/ Cigarette					C173	
Chanachur/ Nut					C174	
Tea/ Biscuit					C175	
Goja					C176	
Other expenditure (transport)					C177	
Food expenses in restaurant					C178	
Others(Please mention)						

Items	Quantity	Price according to sources(Taka)					Total Taka
		Purchase	Own Production	Gift			
Fuel/Electricity(For the last one month)						**C200**	
Firewood						C201	
Ghuta/Ghushi						C202	
Tush/Vhushi						C203	
Patkathi						C204	
Kerosene						C205	
Khar (paddy/ Wheat/ others)						C206	
Leaves						C207	
Firebox						C208	
Candle						C209	
Gas (natural/ non-natural)						C210	
Electricity						C211	
Coal (of any type)						C212	
Others(Please mention)							
Cosmetics and others						**C220**	
Bath Soap						C221	
Washing Soap/Powder/Soda						C222	
Cream (of any type)						C223	
Powder						C224	
Perfume						C225	
Shampoo						C226	
Toothpowder/ Paste						C227	
Haircut						C228	
Comb /Hair Brush						C229	
Hair Oil (Coconut oil etc.)						C230	
Bangles / Lace/ Tip						C231	
Others(Please mention)							

Items	Quantity	Price according to sources(Taka)				Total Taka
		Purchase	Own Production	Gift		
Clothing						
Female/Girl					C300	
Sharee					C301	
Blouse					C302	
Petticoat					C303	
Shallower					C304	
Kamij					C305	
Orghna					C306	
Frok					C307	
Pant					C308	
Gengi					C309	
Shawl/Chadar					C310	
Sweater/cardigan					C311	
Others(Please mention)						
Male/Boy					C320	
Lungi					C321	
Shirt					C322	
Pant					C323	
Punjabi					C324	
Pyjama					C325	
Gangi/ T-shirt					C326	
Under Pants					C327	
Shawl/Chadar/Muffler					C328	
Sweater/Jacket					C329	
Half Pant					C330	
Others(Please mention)						

Items	Quantity	Price according to sources(Taka)					Total Taka
		Purchase	Own Production	Gift			
Other clothes etc.						**C340**	
Gamcha						C341	
Bed Cover						C342	
Pillow Cover						C343	
Table Cloth						C344	
Curtain (window, door)						C345	
Mosquito Net						C346	
Quilt						C347	
Mattress						C348	
Pillow						C349	
Katha						C350	
Kambal						C351	
Others(Please mention)							
Shoe/Sandal (Purchase and repair etc)						**C360**	
Shoe						C361	
Sandal (Skin)						C362	
Sandal (Rubber)						C363	
Kharam						C364	
Shoe Polish						C365	
Repairing expenses						C366	
Others(Please mention)							
Furniture						**C370**	
Bedstead						C371	
Table/Chair/Dressing Table/Tool						C372	
Almari/Book shelf/ meatshelf						C373	
Floor Mattress						C374	
Others(Please mention)							

Items	Quantity	Price according to sources(Taka)					Total Taka
		Purchase	Own Production	Gift			
Cooking Materials						**C400**	
Kerosine stove						C401	
Cooking Pots (clay)						C402	
Cooking Pots (ceramic)						C403	
Glass, plate, others						C404	
Spoon, Khunti, Knife, spade						C405	
Others(Please mention)							
Leisure, Education and others						**C410**	
Radio						C411	
Cassette Player						C412	
T.V.						C413	
Video						C414	
Battery						C415	
Maintenance expenses						C416	
Repairing expenses						C417	
Story books/ Newspaper/ Magazine etc.						C418	
Cinema/ Jatra						C419	
Games/club membership/toys						C420	
Photography						C421	
Laundry expenses						C422	
Others(Please mention)							
Other Households Materials						**C430**	
Trunk/Suit-case						C431	
Lamp						C432	
Sewing Machine						C433	
Ironic goods (spade, Shovel etc.)						C434	
Others(Please mention)							

Items	Quantity	Price according to sources(Taka)					Total Taka
		Purchase	Own Production	Gift			
Personal Materials						**C440**	
Umbrella						C441	
Watch/ Table clock/ Wall clock)						C442	
Hand Bag (Male/Female)						C443	
Glasses						C444	
Gas lighter/ Torchlight						C445	
Ornaments (gold, silver etc)						C446	
Others(Please mention)							

Items (For the last 12 months)			Total expenditure
Expenditure Related to dwelling Houses		C500	
Construction of Dwelling Houses		C501	
Repair of Dwelling Houses		C502	
Repair of Furniture		C503	
Others(Please mention)			
Tax/Interest Payments		C510	
Interest		C511	
Union Parisad Tax		C512	
Penalty		C513	
Remittance to Others Family Members		C514	
Others(Please mention)			
Education		C520	
Tuition Fees (School , College and University)		C521	
Tutor		C522	
Education Materials : Books/notebooks/pen-pencil/ink/Paper etc		C523	
Others(Please mention)		V3234	
Medical Expenditure		C530	
Medical Expenditure		C531	
Medicine Cost		C532	
Other Medical Expenditure, test etc			
Other Expenditure		C540	
Legal Costs		C541	
Religious Festivals (Qurbani, Milad, etc.)		C542	
Donation		C543	
Social Festivals (Sunnat-E-Khatna, Annaproshan, Death Anniversary)		C544	
Others(Please mention)			

5.1 **Information regarding poverty:**
   Do you consider your family as poor

| V51 | |

Code: 1= Yes and 0= No

5.2 If yes, Could you please mention which of the following categories is
      appropriate for your family?

| V52 | |

Code: 1= Moderately Poor and 0= Extremely Poor

5.3 Did you consider your family as a poor before the membership?

| V53 | |

Code: 1= Yes and 0= No

5.4 If yes, could you please mention which of the following categories was
      appropriate for your family before the membership?

| V54 | |

Code: 1= Moderately Poor and 0= Extremely Poor

5.5 Do you think that the total income of your family members has increased after
      becoming a member of the NGO?

| V55 | |

Code: 1= Yes and 0= No

5.6 Could you survive or earn enough income for survival of your family members,
      if the microcredit service is stopped at this moment?

| V56 | |

Code: 1= Yes and 0= No

6.1   Please mention uses of loans provided by NGO?

Loans	Purpose mentioned in the loan application form		Actual Use	
1st Loan	V61A1		V61A2	
Last Loan	V61B1		V61B2	

Code: 1= micro-enterprise, 2= Agriculture, 3= Seed, 4= Irrigation, 5= Fishery, 6= Cattle, 7=Cottage industry, 8=Poultry, 9= Land buying/ Mortgage, 10= Social Deforestation, 11= Habitation, 12= Education expenses of children, 13= Sending foreign or city, 14= Social program, 15=Repayment of other loan, 16= Medical expenses, 17=Others

7.1. Is income from investment of microcredit enough to repay loans?
Code: 1= Yes and 0= No

| V71 | |

7.2. After membership, did you sell any asset to repay loans?
Code: 1= Yes and 0= No

| V72 | |

Social Forestry

10.1 Distance of the household from the nearest social forestry project.

| V101 | |

10.2 Is your household a member of the social forestry project (Code)?
Code: 1= Yes and 0= No

| V102 | |

10.3. If yes, how many years have you been participating in social
      deforestation project?

| V103 | |

10.4.   Income from social deforestation

Income from social deforestation	Revenue (taka)	Expenditure						Net earning
		Own expenses (taka)	Total hours	Taka	Total expenditure (taka)			
Earnings before selling trees						V104A		
Proceeds from selling trees						V104B		

Tree related information:

11.1. With the exception of social deforestation by the NGO, how many trees did you plant in the last one year?

V111	

11.2. Land types?
Code: 1= Own land, 2=Public, 3=Mortgage,4=Share cropping, 5=Others

V112	

11.3. Sources of plants:
Code: 1=Own purchase, 2= Government, 3= NGO, 4= Others

V113	

General attitude towards environment:

Issues	Code						
I do not believe in the fact that men are polluting the environment	2	1	0	1	2	V1201	
Dust, sand, smoke emitted from brick-field and chemicals from mills and factories are polluting the environment continuously	2	1	0	1	2	V1202	
Enormous climatic changes are taking place due to lack of consciousness among general mass	2	1	0	1	2	V1203	
Uses of insecticides and fertilizer are not detrimental for the environment	2	1	0	1	2	V1204	
A portion of used insecticides and fertilizer in the land remains in crops, fruits and vegetables and that is injurious for us	2	1	0	1	2	V1205	
Environment pollution, particularly because of Arsenic there will be a scarcity of pure drinking water very soon	2	1	0	1	2	V1206	

Code (left to right): 2= strongly agree, 1= Agree, 0= neutral, 1= Disagree, 2= Strongly disagree

13.   Attitude towards environment as a Farmer:

Issues	Code						
Modern agricultural system is damaging environmental balance and resources of forests	2	1	0	1	2	V1301	
Increasing use of fertilizer and insecticides is reducing general productivity of land	2	1	0	1	2	V1302	
Gradual increase of use in fertilizer and insecticides is reducing the quality of crops	2	1	0	1	2	V1303	
Uses of chemical fertilizer and insecticides in cultivation are creating adverse effect on nature	2	1	0	1	2	V1304	
The media is exaggerating the fact that environment pollution is the result of modern agricultural system	2	1	0	1	2	V1305	
Underground water is getting polluted day by day as a result of using insecticides and fertilizer	2	1	0	1	2	V1306	
In spite of limitations only farmers can keep the balance of environment	2	1	0	1	2	V1307	
Application of insecticides and fertilizer is not creating any adverse effect, rather it is helping in more quality production	2	1	0	1	2	V1308	
Application of chemical fertilizer in land is acceptable as long as it is generating more income than expense	2	1	0	1	2	V1309	
Both government and private organizations should take more effective steps to keep environmental balance	2	1	0	1	2	V1310	

Code (left to right): 2= strongly agree, 1= Agree, 0= neutral, 1= Disagree, 2= Strongly disagree

SANDEE

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