

**Role of Green Micro-credit in Creating Livelihood  
Options and Women's Empowerment in a Bangladesh  
Wetland**

By

Lubna Yeasmin

A Thesis Submitted to the Faculty of Graduate Studies of the University of Manitoba  
in partial fulfilment of the requirements of the degree of

Master of Natural Resources Management

**Clayton H. Riddell Faculty of Environment, Earth and Resources**

**Natural Resources Institute**

University of Manitoba

Winnipeg

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## **Abstract**

The research examines the role of green micro-credit in creating livelihood options and women's empowerment in Hakaluki *haor*. The role of green micro-credit is found important in creating livelihood options. The more livelihood options that the borrowers have, the less they are vulnerable to crises. Results related to women's empowerment were diverse and complex. Women's empowerment can mean different things to different individuals. Woman's restricted mobility, low skill-set, and domestic workload impeded them from investing and using green micro-credit. Borrowers were found to be innovative, and had the capacity to maximize economic benefit from the green enterprises. The impacts of green micro-credit on environmental sustainability are yet to be assessed. Green micro-credit has not been running long enough. For firmer conclusions, a longitudinal study of sustainability and empowerment under green micro-credit would be needed.

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***DEDICATION***

***This thesis is dedicated to my husband***

***Md Maroof Shahriar***

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## Abbreviations and Acronyms

- ASA: Association of Social Advancement
- BEGCB: Building Environmental Governance Capacity in Bangladesh
- BRAC: Bangladesh Rural Advancement Committee
- CBFM: Community Based Fisheries Management
- CBOs: Community Based Organizations
- CNRS: Centre for Natural Resources Studies
- CPRs: Common Pool Resources
- CIDA: Canadian International Development Agency
- CWBMP: Coastal and Wetland Biodiversity Management Project
- DFID: Department for International Development
- DoE: Department of Environment
- DoF: Department of Fisheries of the Government of Bangladesh
- ECA: Ecologically Critical Area
- FGD: Focus Group Discussion
- GoB: Government of Bangladesh
- GO: Government Organization
- MFIs: Micro-finance Institutions
- MFOs: Micro-finance Organizations
- PAPD: Participatory Action Plan Development
- PRA: Participatory Rural Appraisal
- SEDP: Small Enterprise Development Project
- UBINIG: *Unnayan Bikalper Nitinirdharoni Gobeshona*. In English it means Policy Research for Development Alternatives.
- UNDP: United Nations Development Program

## Glossary

<i>Baors</i>	Oxbow lake
<i>Beels</i>	Small depressed land that becomes inundated during monsoons.
<i>Boro</i>	Winter/dry season rice
<i>Brahmin</i>	High cast Hindus
<i>Haor</i>	A bowl or saucer-shaped shallow depression that look like a single water body
<i>Hijal</i>	Water tolerant trees in flooded forest (swamp forest) “ <i>Barringtonia acutangula</i> ”
<i>Jalmohal</i>	Fishing location given by permit in a water body
<i>Jal</i>	Current net, a kind of gill net which has very small mesh size and which captures very small fish
<i>Jele</i>	Commercial/Subsistence fishermen
<i>Jilapi, nimki, rosogolla</i>	Sweet products made of milk, flour, oil and sugar
<i>Mohajon</i>	Local money lender
<i>Murta</i>	“ <i>Schumannianthus dichotoma/Clinogyne dichotoma</i> ”, a rhizomatous shrub used as a raw material for making mat
<i>Pati</i>	Mat made of natural fibre
<i>Purdah</i>	Muslim religious norm for women to confine themselves from males. Literally a veil.
<i>Taka</i>	Local currency of Bangladesh (1US\$=68 Taka in 2010).
<i>Thonga</i>	Hand-made small packets which are made by paper
<i>Shitol pati</i>	Cool mat made of <i>murta</i> , this type of mat is cold by nature.
<i>Sungrass</i>	<i>Imperata cylindrical</i> , a kind of herb used as a thatching material
Swamp forest	Also known as flooded forest; a forest in which the tree species are ecologically adapted to withstand prolonged flooding (four months or more).

Upazila	Smallest administrative unit of the government administrative system.
<i>Vora</i>	Platform made of bamboos or banana tress tied together with bunch of ropes

# Chapter One

## Introduction

### 1.1 Context

Micro-credit is the extension of small-scale collateral-free loans to poor borrowers in order to foster income generation, poverty reduction and women's empowerment through enhancing self-employment and creating livelihood options (Yunus 1999; United Nations 2005; Hossain and Knight 2008). There are functional differences between micro-credit and micro-finance. Micro-credit is a part of micro-finance. Micro-finance delivers a wider range of financial services such as credit, saving accounts, and insurance, to poor, rural, or landless people; disadvantaged women; marginal farmers; and wage labourers, who largely depend on selling their labour for a living (United Nations 2005). Some micro-finance organizations promote training, education and marketing facilities to clientele along with loans. By providing loans rather than grants, the micro-credit provider can become sustainable by recycling financial resources over and over again (Fisher et al. 2001; Fisher and Shriram 2002). Dokmo (2000) defines micro-credit as "capitalism combined with heart". In addition to providing financial services, micro-credit also has positive implications in improving household well-being (i.e., education, health, better living) (Mahjabeen 2008; Haque and Harbin 2009) and the natural environment as well (CNRS 2010).

The concept of micro-credit was first introduced by Dr. Mohammad Yunus in Bangladesh to open credit channels for the rural poor. The Grameen Bank was established in 1976 and officially registered as a non-profit bank in 1983. Grameen Bank initially lent to both men and women. Exclusive lending to women began in the 1980s,

when it was found that women clientele have higher repayment rates than men. The reasons behind targeting women is that women are good credit risk compared to men, are less likely to misuse the loan, and are more likely to share the benefits with others in their households (Hashemi et al. 1996; Yunus 1999; Kabeer 2001; Khandker 2005; Hashemi et al. 2006). Nonetheless, in Bangladesh, micro-credit programs have been well recognized as an effective poverty alleviation strategy to the poor who are lacking financial sources (Pitt and Khandker 2002; Grameen Bank 2009; Roodman and Morduch 2009). Kabeer (2005) asserts that micro-credit interventions have the potential to achieve the Millennium Development Goals (MDGs) which, among other things, aims to promote gender equality and women's empowerment.

Rural poverty reduction, conservation of natural resources, and gender parity are recognized as the primary goals for economic development of Bangladesh (UNDP 2011). The economic empowerment of women is a must for reducing the high percentage of poverty in Bangladesh (DFID 2000). In Bangladesh, rural women are socially excluded from being involved in development activities due to gender-based labour distribution, and have a limited role in household decision-making, restricted mobility, and limited access to natural, physical, and financial resources (Sebstad and Cohen 2002; Parveen and Leonhauser 2004). During the 1980s, rural women's entrepreneurship role was unveiled by some micro-credit organizations in Bangladesh. Since then a new women's entrepreneur class with micro-credit support is increasingly emerging each year in rural Bangladesh (LBD 2006). Evidences show that women's accessibility to credit and involving women in income generating activities have positive implications in improving

women's decision-making power at the household level (Hulme 1996; Leach and Sitaram 2002; Premchander 2003; Pitt et al. 2006; Hulme and Moore 2007).

Precarious questions about the positive contribution of micro-credit in women's empowerment have arisen in many empirical studies. Some studies show that loans have been taken out by their male counterparts, and benefits from the micro-credit investment are mostly possessed by men (Ackerly 1995; Goetz and Gupta 1996; Kabeer 1998; Johnson and Kidder 1999; Schuler et al. 1999; Amin et al. 2003). Some studies conclude that the empowering effect of micro-credit can be different for different women, depending on their individual and other characteristics (McElroy 1990; Kabeer 2001). Kabeer (2005) argues that all socio-political dimensions of empowerment cannot be improved at a time.

Micro-credit promotes individual and community-based entrepreneurship activities. Community-based enterprise means a community acting cooperatively as an entrepreneur in pursuit of common goals (Peredo and Chrisman 2006). In rural areas, many micro-credit schemes are based on use (and sometimes abuse) of natural resources (CNRS 2011). In many cases, a large number of loan recipients make at least part of their living by exploiting the local common pool resources (CPRs) (Sebstad and Chen 1996; Zeller and Sharma 1998). The interrelation of micro-credit programs and natural environment is through the use of natural resources. Anderson et al. (2002) draws three connections between micro-credit and the sustainable use of CPRs in developing countries. These connections are: 1) entrepreneurship activities among poor borrowers are mostly natural resource-based; 2) micro-credit programs target primarily rural women who are the primary users of natural resources in many developing countries; and 3) in

regular group meetings, sharing of knowledge and ideas can generate innovative ideas to manage natural resources. Considering the negative environmental impacts caused by micro-enterprises, many conservation NGOs provide micro-credit with the condition of natural conservation. For example, in Thailand, PDI (Population and Development International) is encouraging people to reduce their use of timber and non-timber forest products by promoting alternative livelihood options, supplemented by micro-credit (Anderson et al. 2002).

There has been hardly any effort to investigate the potentialities of micro-credit in natural resource management and conservation practices in Bangladesh. The applicability of community-based natural resources management and livelihood improvement has already been established in many parts of the world (Berkes 2004). A renewed interest in maintaining environmental sustainability and creating livelihood options by providing micro-credit is critically needed for Bangladesh to alleviate poverty and conserve the natural environment. Livelihood diversification, supplemented by micro-credit, can generate income and contribute to family welfare (Hulme and Mosley 1996).

A new approach of micro-credit was introduced in 2010 in Hakaluki *haor* in Bangladesh which the development practitioners view as green micro-credit. For the particular context of this project, green micro-credit refers to small-scale loans to the poor for making a livelihood by using renewable natural resources and the environment in a sustainable manner (Haque 2006). The main goal of green micro-credit schemes is to develop green enterprises (i.e., organic farming, nursery, tree plantation, mat making and handicraft, aquaculture) by providing the people with micro-credit support. Green micro-

credit programs are in effect a variation of conventional micro-credit, an incremental change on conventional schemes.

Before the inception of the green micro-credit lending system, in 2009, CNRS asked its conventional micro-credit borrowers to come up with green enterprise development plans. At the initial phase, six borrowers were interested in taking green micro-credit. Borrowers chose two projects: 1) organic vegetable cultivation and animal husbandry (group-operated) and 2) *murta* mat making and handicraft (individually-operated). In October 2010, the organic vegetable cultivation and animal husbandry project was officially divided into two projects: 1) organic vegetable cultivation and dairy food products and 2) animal husbandry (cow rearing).

The research focused on the role of green micro-credit in creating livelihood options and women's empowerment in Hakaluki *haor*. The research also queried if green micro-credit could contribute to household well-being of the borrowers. The study considered women's engagement in income-generating activities as an indicator of their empowerment. This research is a part of a larger team project of CIDA (Canadian International Development Agency) entitled "Building Environmental Governance Capacity in Bangladesh (2007 to 2013)". As part of this CIDA project, two NGOs, Bangladesh Rural Advancement Committee (BRAC) and Centre for Natural Resources Studies (CNRS) are working as major partners of the two universities involved (University of Manitoba and North South University). The centre for Natural Resource Studies (CNRS) is a leading community-based NGO that has been working on sustainable resource and environmental management programs in Hakaluki *haor* since 1992.

## **1.2 Goal and Objectives of the Research**

The goal of the study is to examine the role of green micro-credit in creating livelihood options and women's empowerment in Hakaluki *haor* in Bangladesh. The objectives are:

- To assess the role of micro-credit and green micro-credit in creating livelihood options;
- To identify women's priorities in the use of green micro-credit, and to determine the factors that can constrain (or facilitate) women's participation in decision-making in obtaining and using green micro-credit; and
- To examine if green micro-credit can enhance household well-being and environmental sustainability.

## **1.3 Methods and Research Plan**

For my research, I used a qualitative case study approach with the collection of qualitative and quantitative data (Creswell 2007; Creswell 2009). Data were collected through participatory methods and tools. Involvement of community members and stakeholders was required in the data collection procedure to address the research objectives. Participatory research methods are favourable in investigating rural livelihoods and gathering information about people's mindset about local problems and solutions (Chambers and Blackburn 1996). Household interviews and key informant interviews were done with semi-structured questionnaires. I employed several participatory rural appraisal (PRA) tools. These included: focus group discussions, ranking exercises and small workshops for collecting qualitative and quantitative data (Chambers 1994a; Chambers 1994b; Chambers 1994c; Chambers 2004). I selected three households as cases to gather in-depth insights into borrowers' livelihoods, households'

socio-economic status, impact of green micro-credit, women's empowerment, and what was going on in the community. Case studies were done through extensive interviews, participant observations, and detailed field notes. After conducting interviews, focus group discussions, and informal visits, I wrote daily field notes based on participants' discussions and my observations relevant to my research.

### **Research Plan**

My field study spanned a four-month period from September to December 2010. The research was conducted in three phases:

#### **Phase I: Scoping and learning-gathering (September 1<sup>st</sup> to 15<sup>th</sup> in 2010):**

Phase I consisted of scoping and familiarization with the study village, Nonua-Pabijuri. I was acquainted with CBOs and two women's self help groups (WSHG), namely, *Nonua Mahila Samiti* and *Pabijuri Mahila Samiti*. During that time, I attended weekly meetings with women's groups and CBO members that were organized by CNRS. I informally chatted and discussed with local people. In doing so, support and assistance were taken from CNRS.

#### **Phase II: In-depth field investigation (3 months; mid of September to mid of October)**

After becoming intimate with the community, I started an in-depth field investigation by using participatory tools. The household interviews were done with the micro-credit and green micro-credit borrowing households. I selected 31 households; among them 25 were conventional-borrowing and 6 of them were green-borrowing households. I had the opportunity to closely monitor how the villagers cope with the post-flood period; how the borrowers repay loans; and livelihood activities in wet and dry seasons. I closely

observed how the borrowing families grow crops and vegetables. A total of four focus group discussions were conducted during that period.

**Phase III: Validation, workshop and documentation (last two weeks of December in 2010)**

A small workshop was organized with the active participation of women's self-help groups, CBO members, CNRS staff, and some potential green micro-credit borrowers. The primary findings of my research were provided to them and after that, feedback and comments were gathered from the participants.

**1.4 Limitations of the Research**

The research took place in the birth year of green micro-credit in 2010. Only six households took green micro-credit and the research covered all six of these households. This research does not explicitly point out the environmental sustainability impact of green micro-credit enterprises. Environmental sustainability is a longer term outcome, and needs to be assessed over time. Green micro-credit has not been running long enough to assess its environmental sustainability. For firmer conclusions, a longitudinal study of sustainability under green micro-credit would be needed. Rather, this research gathers participants' perceptions about the potentialities of green micro-credit, and what can be done to sustain natural resources. Another limitation of this research is that it does not attempt to determine societal-level indicators (i.e., political involvement) of women's empowerment. Some qualitative findings were related to the perception of respondents and this may not be representative of the overall situation of borrowers.

The researcher was faced with several challenges during data collection processes in the field. Typically the entire *haor* remains flooded for 6 months but the surrounding villages are flooded for 3 to 4 months. The timing for conducting field research was set from June 1<sup>st</sup> to the end of September in 2010. Unfortunately, the study site Nonua-Pabijuri experienced the most devastating and prolonged flood in the recent history. The flood lasted from April to September 2010. It was literally impossible for me to get to the village in June as the road transportation systems were collapsed until August. I was able to reach the study site in September but I still had to use a boat to visit houses.

Understanding language, a different dialect of Bangla, was also a challenge. My research assistant translated the local dialect for me. After spending a couple of weeks with the study participants, I learned their local dialect. During household interviews, I was confronted with challenges when I asked questions about their monthly income and surplus from the investments of micro-credit and green micro-credit. I had difficulty in finding borrowers in the months of October to December as they were very busy in preparing the farming lands for cultivation.

This research is a first attempt in Bangladesh in the study of green micro-credit. There is still a lot of room for learning and further research about the applicability and potentiality of green micro-credit in creating rural livelihood options and women's empowerment.

### **1.5 Study Area**

The research was carried out in Hakaluki *haor* (wetland) in Bangladesh. A *haor* is a wetland ecosystem which is physically a bowl or saucer shaped shallow depression, also known as a back swamp (IUCN 2002). Hakaluki *haor* is the largest inland freshwater

wetland ecosystem in Bangladesh (Chapter 2; Figure. 2.1), located at the north-eastern part of Bangladesh. The entire *haor* possesses more than 238 interconnected *beels* with an area of 18,383 hectares (45,406 acres) (CWBMP 2005). *Beels* are small saucer-like depressions of a marshy character. *Beels* usually dry up in the winter but expand into shallow sheets of water during monsoon. The *haor* is a treasure of natural resources for its enriched fishery resources, variety of flora and fauna species, and economic values of swamp forests. A list of ecosystem goods and services of Hakaluki *haor* is prepared based on my field observation, and some secondary sources (Table 1.2).

Hakaluki *haor* has been highly exploited for a long time for its valuable natural resources (IUCN 2004). Man made factors include overuse of natural resources, lack of property rights to small-scale fishers and poor people, human encroachment over *beels*, and clear cutting of swamp forests for firewood (Nishat 2003). Low standard of life and lack of basic household facilities of the inhabitants are the critical factors for degrading the natural environment. Over 200,000 people live in and around the *haor* who for generations have been dependent on *haor* resources for their livelihoods.

During the 1990s, some national and environmental organizations in the country have drawn government attention and urge the conservation of wetland resources (Khan et al. 1994; Nishat 2003). In 1999, the Government of Bangladesh declared Hakaluki *haor* as an “Ecologically Critical Area” (ECA) under the 1995 Environment Conservation Act of Bangladesh. Hakaluki *haor* is a protected Ramsar site.

**Table 1.2: List of Ecosystem Goods and Services of Hakaluki Haor**

Natural resources	Ecosystem goods and services
Water bodies	<p>A collection of more than 238 <i>beels</i> (CNRS 2002)</p> <ul style="list-style-type: none"> <li>- Protect lower floodplains from flash flood; recharge the water tables (Nishat 2003)</li> <li>- Aesthetic value</li> <li>- Resting place for migratory birds</li> </ul>
Fishery resources	107 species of fresh water fishes (CNRS 2003; IUCN 2004).
Agriculture	Extensive floodplain for dry season rice cultivation and vegetables
Forest (Swamp and mixed evergreen rainforest)	<ul style="list-style-type: none"> <li>- <i>Hijol</i> (<i>Barringtonia acutangula</i>) trees are used for making boats and houses.</li> <li>- Other swamp forest trees are used as firewood.</li> <li>- Collection of reeds and grasses</li> <li>- Small herbs are used as medicinal plants</li> <li>- Carbon sequestering.</li> <li>- Small herbs and trees are used as green manure (Field data 2020)</li> </ul>
Vegetation	<p>73 species of wetland vegetation including</p> <ul style="list-style-type: none"> <li>- Leafy wetland vegetables</li> <li>- Thatching material for roofing and making houses.</li> <li>- <i>Murta</i> fibre plants</li> <li>- Small soft plants are used as fodder for domestic animals</li> </ul>
Migratory bird species	<ul style="list-style-type: none"> <li>- A shelter for migratory waterfowl</li> <li>- Important species are bar-headed goose, steppe eagle, spotted redshank, osprey etc (IUCN 2000)</li> </ul>
Livestock	In the dry season, grasslands near <i>beels</i> have become the permanent grazing lands for cows and goats.

I selected the village Nonua-pabijuri which was located 3 km upstream from the main *haor*. The reason behind selecting Nonua-Pabijuri was that green micro-credit schemes were introduced in that village in January 2010. The villagers of Nonua-Pabijuri have been one of the most successful and co-operative conventional micro-credit borrowers of CNRS since its inception of micro-credit in 1998.

## **1.6 Conceptual Approaches of the Research**

### **1.6.1 Women in Development (WID) approach**

At the beginning of the 1970s, Ester Boserup (1970) spotlighted that development theory underestimated the role of women in productive activities. The Women in Development (WID) approach was taken up at the end of 1970s with a consideration that women's productive role in economic activities should be made visible. This realisation led to the development—world's initial strategy of supporting self-employment and women's enterprise came to be recognised as being required for releasing women's economic potential. The WID approach assumes that women have been left out from many development initiatives due to gender-based divisions of labour within the society. Women and men are equally needed in development initiatives (Rathgeber 1990). This approach also focuses on helping women by providing them with credit support to start businesses.

The WID approach is relevant to my study because my research focuses on women's involvement in income-generating activities through micro enterprise development. Income earning opportunity can empower them in decision-making at the household level. In Bangladesh, only 18 percent of women participate in the labour force compared with 43 percent of men, which is a major obstacle to significantly improving women's

socio-economic status (BBS 2001). It is reported by United Nations (2002) that Bangladeshi women are ascribed a lower status than men who have the sovereign power to control households and society as whole, while women are often secluded in their homes.

### **1.6.2 Gender and Development (GAD) approach**

The GAD approach focuses on transforming unequal power relations between men and women rather than focusing only on women (Humble 1998). This approach asserts that women are not often consulted to become a part of formal decision-making processes in development initiatives. Women's contribution in development activities has remained invisible and left without acknowledgement. With the GAD approach, feminist scholars have argued that women's empowerment and full participation in all decision-making processes are a requirement for sustainable development (Seymour and de Leon 1997).

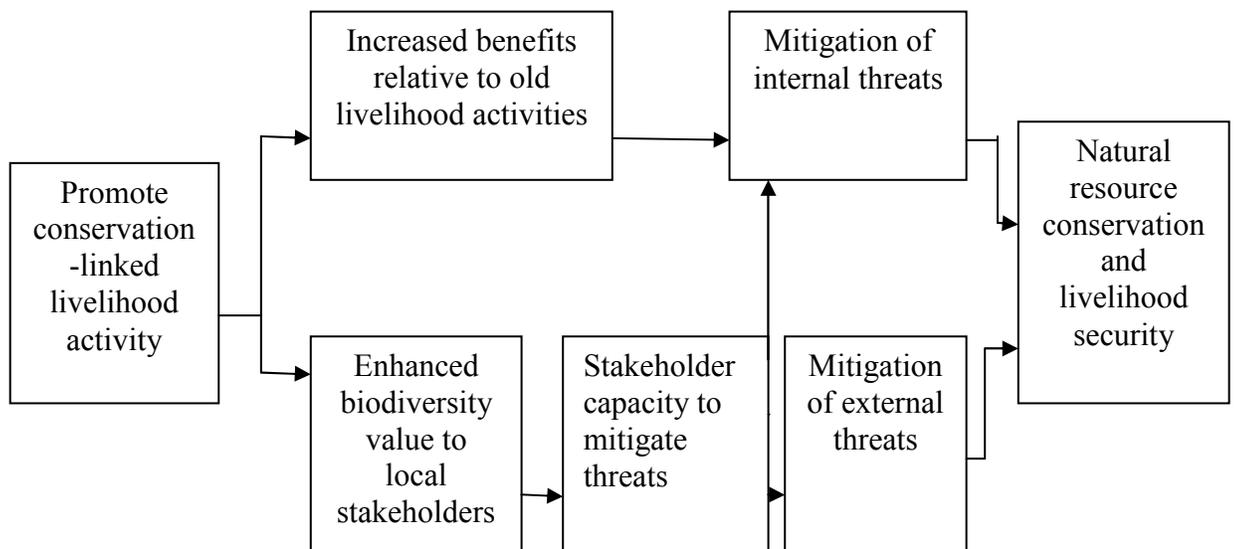
I see the relevance of the GAD approach with my research on green micro-credit. One of my research objectives is to identify women's priorities in the use of green micro-credit, and to determine the factors that can constrain (or facilitate) women's participation in decision-making in obtaining and using green micro-credit. In wetland areas of Bangladesh, women's role in fisheries remains unsung and their decision-making power is ignored by male fishers (Sultana and Thompson 2008; Dev 2011).

Men and women are the users of natural resources but women are often faced with different realities than men due to social construct. Women's lack of property rights and less access to natural resources can risk their livelihood. Agarwal's (1989, 1990, 2009, 2010) study on Indian rural women shows that women are being deprived in accessing agricultural lands and forest products due to the gender-based culture. Equal

participation of both men and women is crucial in decision-making processes where natural resources management is concerned (Haque 2006). The research speculate that identifying women’s priorities in livelihood enhancement activities and understanding the reasons behind their priorities can help to implement entrepreneurship activities for them.

### 1.6.3 Linking livelihood and conservation

In the early 1990s, conservationists began to develop new approaches to link economic well-being and natural conservation. These new approaches were based on making livelihood activities dependent on and directly linked to biodiversity (Wells and Brandon 1992; Western and Wright 1994; BCN 1997; Pretty and Smith 2004) of the area. Livelihood-driven conservation (Salafsky and Wollenberg 2000) efforts intend to develop a dependent relationship between biodiversity and the surrounding people (Figure 1.1).



**Figure 1.1: Linking Livelihood and Conservation (Salafsky and Wollenberg 2000)**

Local stakeholders are given an opportunity to gather economic benefit from the biodiversity, and this would be an incentive to stop external and internal (harmful

livelihood activities) threats to the natural environment. Following this strategy, local communities can develop livelihood activities by developing small-scale enterprises. The idea of creating livelihood options of local communities for biodiversity conservation has been successful in different parts of the world. Strengthening community's social capital can effectively conserve biodiversity (Pretty and Smith 2004). As mentioned earlier, green micro-credit intends to develop small enterprises to create livelihood options for local people. Creating more livelihood options can reduce the unsustainable use of *haor* resources. Micro-credit systems require regular group meetings which can offer the opportunity to exchange women's indigenous knowledge and innovative ideas about natural resources management (CNRS 2009).

Thus the livelihood-driven conservation concept is relevant to green micro-credit. The concept of green micro-credit is based on the Millennium Ecosystem Assessment Framework, 2005. The framework describes that improving ecosystem goods and services can ensure household financial security and conserve natural resources for human well-being. I will describe the framework in Chapter 5.

### **1.7 Justification for the Research**

Due to rapid environmental degradation, the percentages of poverty in developing countries will likely rise if the problem is not tackled (Brundtland 1987; World Bank 2001; United Nations 2005; UNDP 2011). The most devastating effect of chronic poverty can happen with poor people, particularly, who are out of wage employment, and dependent on natural resources for making a livelihood (Gupta 1991; Dasgupta 2001; UNDP 2011).

In Bangladesh, degradation of natural resources can increase the percentage of rural poverty. Low-skilled rural people make their livelihood based on farm and non-farm natural resources. Sometimes dependency on natural resources leads to over exploitation of natural resources. In this regard, creating more livelihood options through entrepreneurship activities should be one of the priority options in the development planning for Bangladesh.

Small-scale enterprise development by providing micro-credit has already been successfully established in Bangladesh. However, limited efforts have been made to directly link livelihood diversification with the conservation of local common pool resources by using micro-credit. The green micro-credit scheme assumes that women's equal participation, like men, is necessary in natural resources management. As women have a unique and intimate relationship with environmental resources and knowledge about local ecosystems (Dasgupta and Goran-Maler 1994; Agarwal 1997; Agarwal 2009). Woman's daily work contributes to a unique and intimate relationship with environmental resources and knowledge about local ecosystem. This is why women need to be involved in local small enterprises, if enforce rules governing resource exploitation (Rocheleau and Edmunds 1995; Agarwal 2010). Women's involvement in income-generating activities can enhance their decision-making power at the household level. Enhancement of women's household decision-making power also translates into better prospects and greater well-being of children, and households in general (Kabeer 2005).

### **1.8 Significance of the Research**

After the inception of green micro-credit in January 2010, it was important to gather information about borrowers' perceptions and lessons learned, the challenges and barriers

they faced while operating the green enterprises, and the overall outcomes from the projects. It was important to document the experiential learning, experiences, and feedback from the green micro-credit borrowers to further the micro-credit initiatives. This research will help to strengthen green micro-credit operations and develop further green enterprises by acknowledging participants' knowledge, their priorities, and concerns as findings in the research.

### **1.8 Organization of the Thesis**

The thesis is organized into six main chapters. Chapter One outlines the research context, objectives, methods, limitations, and the significance of the research. Chapter Two describes the study area; discusses the philosophical approach for the research, the justification of doing a case study approach, and the data collection procedures. Chapter Three depicts the institutional background of micro-credit and conventional and green micro-credit operations of CNRS, and discusses the livelihoods of the study area, borrowers' socio-economic characteristics, and the role of micro-credit and green micro-credit in creating livelihood options. Chapter Four begins with outlining women's livelihoods in the study area, men's and women's priorities in the use of green micro-credit, and discusses the indicators of women's empowerment. Chapter Four identifies the factors that impede women in obtaining and using the green micro-credit. Chapter Five discusses how the green enterprises are operated; and what the barriers are in implementing green enterprises. Chapter Six provides a synthesis of all the key findings that have been discussed in the previous chapters, along with policy implications and feedback collected from the participants for further improvement of green micro-credit operation and resource management in Hakaluki *haor*.

## Chapter Two

### Study area and Methodology



**Plate 1: Hakaluki *Haor* in Winter**



**Plate 2: The View of the Study Village, Nonua-Pabijuri**

## 2.1. Introduction

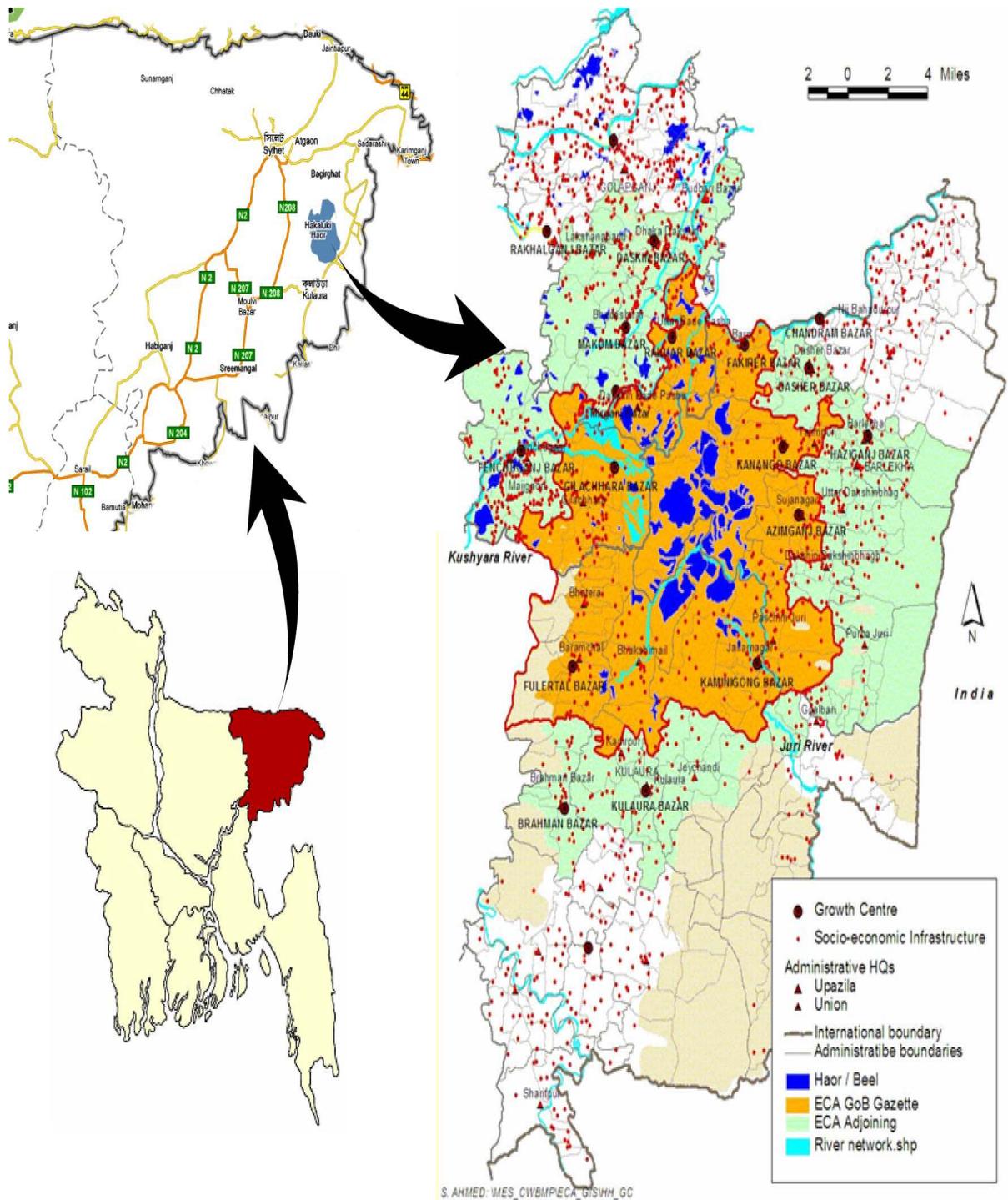
This chapter describes the study area and details methods applied in this study to address the research objectives. This chapter begins with a description of the study area. In the third section, the philosophical approach for participatory research is described. The fourth section describes the usefulness of using a case study approach. Under the fifth heading, detailed methodology for the research is illustrated. The research used several participatory rural appraisal (PRA) tools including focus group discussions, participant observation, and key informant interviews for data collection.

The research used a qualitative case study approach with the collection of qualitative and quantitative data (Creswell 2007; Creswell 2009). Mixing of qualitative and quantitative data is gaining credibility in the literature on development methods (Ellis and Freeman 2004). Qualitative research is meant for exploring and understanding the meaning that an individual or group ascribes to a human problem in a natural setting (Creswell 2009). In contrast, quantitative methods usually have the merits of generalization, testing and validating established constructed theories about how things happen, and generating sets of numeric data which can be processed using statistical software (Creswell 1998; Creswell 2009).

## 2.2 Selection of the Study Area

“When I was a boy, I used to cross the wetland forest when go to school. While crossing, I was scared because the forest was so dark and dense. The trees were tall and big. The forest was so dense that wild animals had to walk straight because they could not move around their back in the woods.”

(Kashem Miah, a 60-year-old male villager at Hallar par, Hakaluki *haor*)



**Figure 2.1: Location of Hakaluki Haor (Source: CNRS)**

The research was carried out in Hakaluki *haor* (Figure 2.1), located in the north-eastern area of Bangladesh. Kashem's comment reflects that Hakaluki *haor* has been facing serious environmental degradation for years. Administratively, Hakaluki *haor* falls under the jurisdiction of two districts, Moulavibazar and Sylhet made up of five *upazillas* (small administrative units under a district), namely, Barolekha, Juri, Sujanagar, Pabijuri and Kanungobazar. The study area Hakaluki *haor* is under Barolekha *upazilla*.

There are eleven *unions* (smallest administrative unit) Bhatara, Baramchal, Bhakshimail, Jaifarnagar, Barni, Talimpur, Sujanagar, Paschim Juri, Gilachhara, Uttar Bade Pasha, and Sarifganj under Barolekha *upazilla* (Figure 2.2). Nonua-Pabijuri falls under the jurisdiction of Moulavibazar district of Sylhet division. Nonua-Pabijuri is under Talimpur union of Barolekha *upazilla*. The study village is surrounded by Jallar *haor* (Figure 2.2). The environmental goods and services of Hakaluki *haor* are listed in Chapter 1 (Table 1.1).

The economic value of fish and other aquatic resources, (mainly plant products), from wetlands are considered to be more than double the return from a single rice crop (Colavito 2002). Hakaluki *haor* contains more than 230 small, medium and large interconnected *beels* (Nishat 1993; CNRS 2002; IUCN 2004). In the wet season, these areas are submerged and turn into a single water reservoir (Alam 2004). A total of 338 individual *jalmahals* (water bodies administered as fisheries) and 12 group *jalmahals* are assigned to fishermen.

Wetland ecosystems provide a wide range of economic and non-economic benefits to the local people as well as to the people of Bangladesh. Table 2.1 presents the total economic

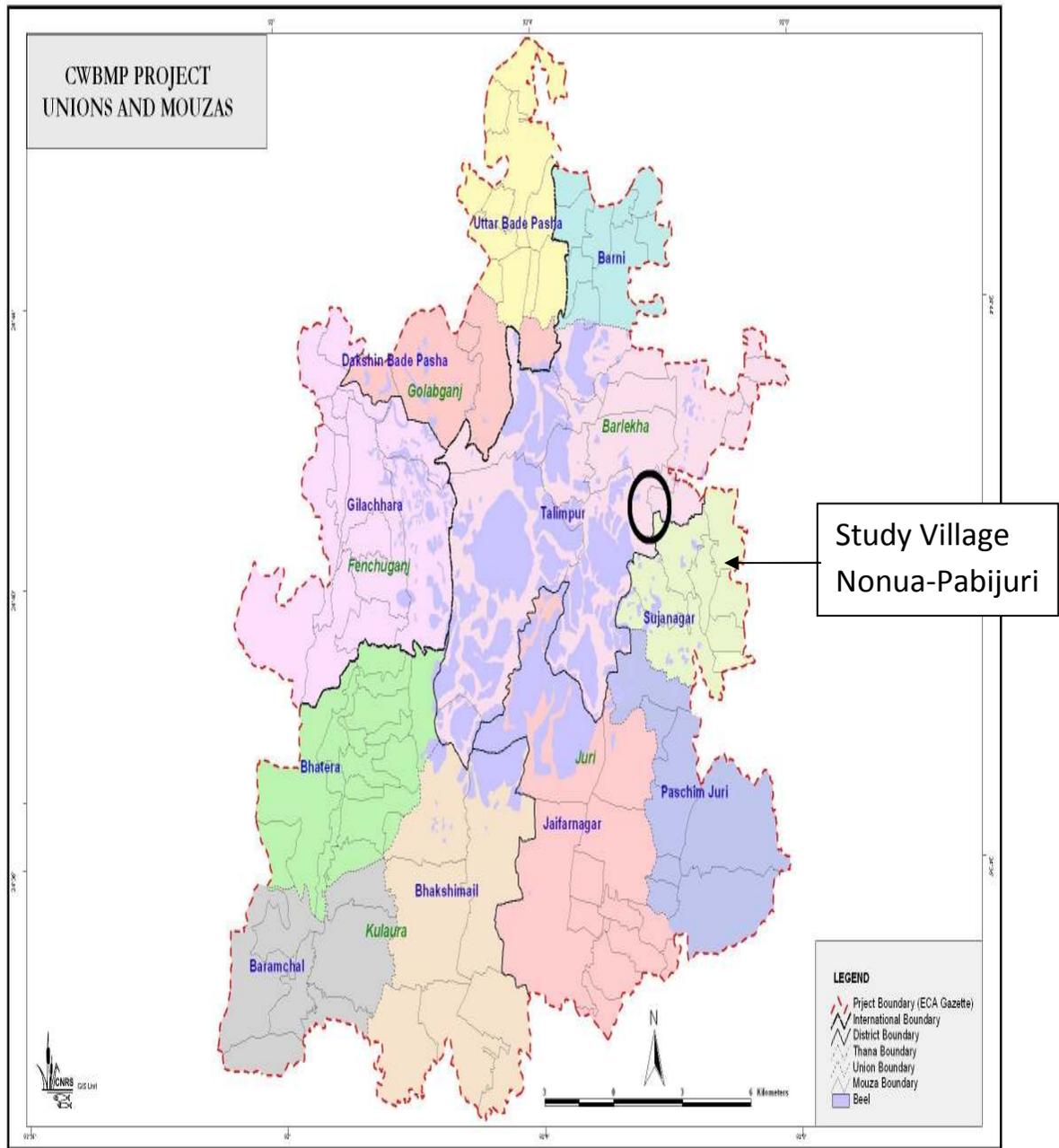
value of Hakaluki *haor* which has been categorized into direct, indirect, option, and non-use values.

**Table 2.1: Economic Value of Hakaluki *Haor***

<b><u>Direct values</u></b>	<b><u>Indirect values</u></b>	<b><u>Option values</u></b>	<b><u>Non-use values</u></b>
Agriculture, fisheries, fire wood, pools, thatch, wild foods, flora and fauna, medicinal plants, pasture, transport, <i>murta</i> plant, reed and swamp forest, tourism etc.	Regulating water quality and flow, water storage and recharge, soil nutrient cycling, flood attenuation, micro-climate etc.	Possible future uses and applications, such as industrial, leisure, pharmaceutical, water use etc.	Cultural value, aesthetic value, heritage value, bequest value etc.

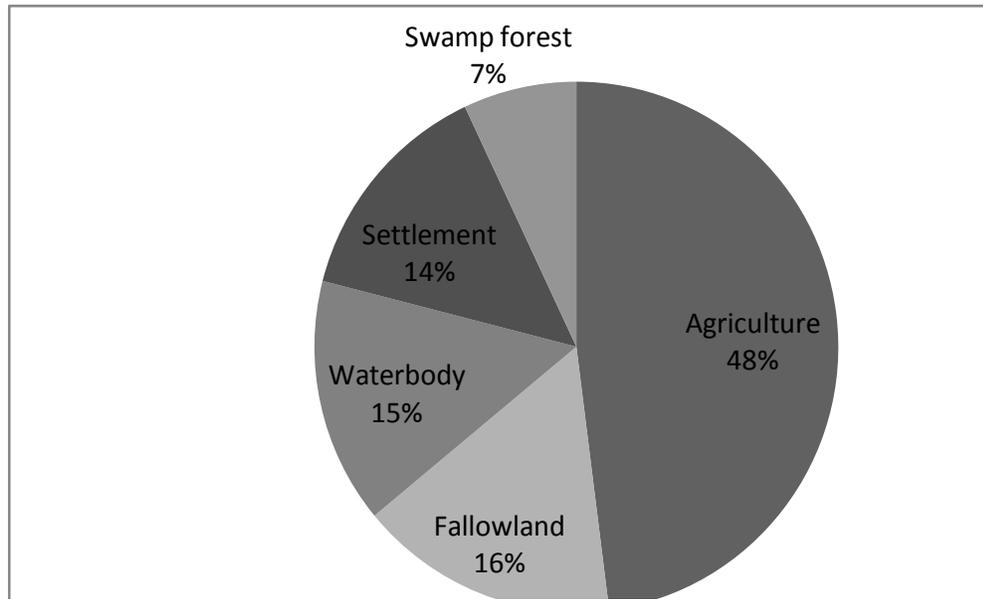
**Source: Followed by Zareen and Sumon (n.d.)**

According to CNRS (2010), there are 176 water bodies (52% of the total wetland) leased out to fishers' cooperatives, youth groups, and individuals; lease fees are charged from 400 taka to 600,000,0 taka depending on the size of *jalmahals*. Hakaluki *haor* is one of the most important habitats of flooded forest (swamp forest) (Nishat 2003). Flooded forest provides fuel wood, fodder, medicinal plants, shelter for fish species, and house building materials for local communities. The main tree species of flooded forests are *Hijol* (*Barringtona acutangula*), *Koroch* (*Pongamia pinnata*), and *Barun* (*Crataeva nurvala*). Hakaluki *haor* is the habitat for 73 species of aquatic vegetation. This vegetation is the source of fuel and organic fertilizer for the local people (IUCN 2002). The marshy lands of *haor* support growing *murta* (*Schumannianthus dichotoma*) plants, widely used for making mats and other handicrafts.



**Figure 2.2: Location of Nonua-Pabijuri (Source: CNRS 2009)**

Categorized by CWBPM in 2005, five types of land use patterns were identified in Hakaluki *haor*: agriculture (48%), fallow land (16%), water bodies (15%), settlement (14%), and flooded forest (7%) (Figure 2.3).



**Figure 2.3: Land-use Distribution in Hakaluki *Haor* (Source: CWBMP 2005)**

Agriculture and fishery are the two main livelihoods in the study area (IUCN 2004; Rabby et al. 2011). Fishing is the best optional source of income for the people of Hakaluki *haor* (Alam 2004). For marginal and landless farmers, fishing is a critical component of their livelihood (Alam 2004). The main crop grown in the *haor* basin is *boro* or dry season rice. Early monsoon flash floods often cause extensive damage to *boro* crops (IUCN 2002). Water logging during April to June takes its toll on *boro* output. Many of the environmental problems in the area (i.e. overfishing, deforestation) are partly linked to short crop season. The poor resource users exploit *haor* resources because of their need and financial constraints. In Hakaluki *haor*, 32 of the 107 fish species are nationally threatened, approximately 12 species are vulnerable, 16 species are

declared endangered, and 4 species are critically endangered (Craig et al. 2004). Hakaluki *haor* is home to a large number of resident and migratory waterfowl. There are well over 70 types of bird species found in the ECA. It supports 20,000 resident waterfowl (CWBMP 2005). Overall bird population is declining at *haor* due to habitat degradation and illegal bird hunting, with the use of guns, nets, and poison.

A number of government bodies and NGOs are working in Hakaluki *haor* to conserve the natural environment. These are: forest resources management project; management of aquatic ecosystem through community husbandry (MACH); *haor* and floodplain resource conservation and management of medicinal plants; and coastal and wetland biodiversity management (CWBMP) (Soeftestad 2000). Following these conservation efforts, the community-based fisheries management (CBFM-2) project was developed and implemented by CNRS, (2001 to 2006) with financial support from DFID. At that time most of the community-based organizations (CBOs) were formed. These CBOs are still an integral part of resource management activities in Hakaluki *haor*.

Nonua-Pabijuri was selected for the research because green micro-credit was introduced there. In Nonua-Pabijuri, CNRS has been operating its conventional micro-credit operations since 1998; however, green micro-credit did not start until January 2010. There were 76 households in the village of which 31 were studied for the research (Table 2.2).

**Table 2.2: Location and Basic Statistics of Nonua-Pabijuri**

<b>Issue (Nonua-Pabijuri)</b>	<b>Location and basic statistics</b>
Location and jurisdiction	Division-Sylhet; Jurisdiction-Moulvibazar; Upazilla- Barolekha; Union-Talimpur.
Proximity to <i>haor</i>	3 km upstream from the main <i>haor</i>
Total households	76
Total population	502; male-253 and female-249.
Number of micro-credit and green micro-credit borrowing households	Conventional micro-credit borrowers-25 Green micro-credit borrowers-6

**Source: *Upazilla Statistical Book 2008, Field Data, 2010***

There were 25 conventional micro-credit borrowing households and 6 green micro-credit borrowing households. I worked with two women's self-help groups, Nonua *mahila samiti* and Pabijuri *mahila samiti*. Nonua *mahila samiti* was formed at the time of the CBFM-2 project in 2001, and comprised all women members. The reason for selecting only women as members was to involve women directly in fisheries management. At that time women were not allowed to join CBOs with male members. The Sylhet division is described as conservative compared to others parts of Bangladesh. Nonua *mahila samiti* had 17 members and Pabijuri *mahila samiti* had 14 members in 2010.

### **2.3 Philosophical Approach for the Participatory Research**

The goal for the research was to examine the role of green micro-credit in creating livelihood options and women's empowerment in Hakaluki *haor*. The research followed

participatory methods and tools to address the research objectives. Participatory research is defined as an inquiry process that provides a voice for the marginalized participants, raising their consciousness or advancing an agenda to improve people's lives (Creswell 2009). The participatory research approach arose in the 1970s and 1980s in response to the classical top-down, non-inclusive, expert or facilitator-based development interventions that were doing little to improve the lives of the rural people (Hickey and Mahon 2004).

There is a growing consensus among scholars that social constructivism had failed to go far enough in advocating for an action agenda to help marginalized peoples (Heron and Reason 1997). Heron and Reason (1997) claim that the constructivism paradigm does not have any identified epistemological role in its inquiry paradigm for experiential knowing. On the contrary, participatory approaches allow learning from local people directly, on the site, face-to-face, and such learning is progressive with the scope of exploration and cross-checking (Chambers 1994b). Maguire (1996) argues that the common link between women's empowerment and participatory research is that they both discuss transformative intentions (power-sharing and decision-making) and advocate for social change. Maguire (1996) says "community empowerment will not certainly be possible without ensuring women's participation in development project". Kumar and Cordbridge (2002) describe participatory research as "the proper objective of participation is to ensure the transformation of existing development practice and, more radically, the social relations, institutional practices and capacity gaps which cause social exclusion". Participatory research has become plausible for my research on green micro-credit because the participatory paradigm focuses on (a) women's empowerment (Lincoln and

Guba 2000) and (b) social capital (network and associations) (Hickey and Mahon 2004). As mentioned earlier micro-credit focuses on women's empowerment, and their credit operations are run based on borrowers' social capital. Green micro-credit is trying to promote economic emancipation of women by involving them in entrepreneurship activities. Women's involvement in income-generating activities will have positive impacts in improving their livelihood. The credit operation system of green micro-credit is developed on borrowers' capacity of making social network.

Williams et al. (2003) asserts that in development activities transformation of power does not necessarily involve a reversal of power relations but a strengthening of the bargaining power of the poor within these relations. For example, in a village aid program in Ghana, participatory research was selected to make the results transparent and public. The processes of decision-making were resisted by many women because it cut down their opportunities to raise their voice through the male elders. Participatory interventions can facilitate those kind of opportunities for disadvantaged women. Through participation, the poor develop political capabilities that enhance their room to manoeuvre within local power relations, including their capacity to hold patrons to account (Hickey and Mohan 2004).

In Bangladesh, participatory research methods have been successfully employed in some development projects. For example, in 2002-03, PAPD (Participatory Action Plan Development) was developed by CNRS in association with local stakeholders to manage fishery resources. PAPD is now widely used for the floodplain fisheries context. Outside

Bangladesh, PAPD is used by the World Fish Centre in Vietnam and in coastal India (Kerala) and Cambodia.

#### **2.4 Strategies of Inquiry: Use of Case Study Approach**

To Hesse-Biber and Leavy (2006), qualitative research employs a diverse range of methods (i.e., in-depth interviewing, focus groups, case study), develops research topics and questions as vast as our imaginations, and expands the topics. Qualitative research outcomes are highly believable because qualitative research reports actual statements from real people (Creswell 1998). The strength of the case study approach is that it engages not only qualitative techniques, but has the benefit of mixing of quantitative and qualitative evidence also (Yin 2009). The case study approach is characterised by being particularistic and descriptive, as it seeks to illuminate the reader's understanding of an issue (Stake 1995). Qualitative case studies involve an in-depth exploration of a single instance or event (a case) without following any particular methods of data collection or data analysis (Tellis 1997; Yin 2009).

I selected three households and each of them was considered an individual case. As a researcher, I built rapport with the micro-credit borrowers and their family members so I could collect detailed and correct information for my research. I kept repeating visits and spent a significant amount of time with two women's groups of the village, namely *Nonua Mahila Samiti* and *Pabijuri Mahila Samiti*. I regularly attended the money collection day of CNRS which used to take place every alternate Saturday. It gave me the opportunity to hear how the borrowers were repaying weekly instalments (payments), and borrowers' success and failure stories.

## 2.5 Data Collection Procedure: Uses of PRA Tools

My research objectives required extensive involvement of local people in my data collection procedure. Participatory rural appraisal (PRA) tools are emerging as development practitioners search for better ways and PRA intends sharing and empowering; outsiders are convenors, catalysts, and facilitators who enable local people to undertake and share their own investigation and analysis (Chambers 1994a). Participatory rural appraisal as defined by Chambers (2004) “is a family of continuous evolving approaches, methods, values and behaviours which has turned much that is conventional on its head. It seeks to enable local and marginalized people to share, enhance and analyze their knowledge of life and conditions, and to plan, act, monitor and evaluate.” PRA considers that the poor people are creative and capable, and can and should do much of their own investigation, analysis, and planning (Chambers 1994a). PRA application includes a village resource management plan (PID and NES 1989), credit programs (i.e., finding and selecting poor people for credit programs), and women and gender related issues (Welbourn 1991). I used three PRA tools (Table 2.3) focus group discussions, key informant interviews, and small workshops to pursue my research objectives.

The preliminary actions of this research include: meeting with CNRS officials and stakeholders of *haor* resources to receive their inputs on the research purpose and, most importantly, to receive their approval to conduct the research. During my field work, my first intention was to create a friendly and open environment with the communities so

everyone could share his/her knowledge and provide opinions in a friendly environment without any hesitation.

**Table 2.3: Data Collection Procedures**

<b>Data collection procedures</b>	<b>No. of events/ people involved</b>
Household interviews with semi-structured questionnaire	31 household interviews with borrowers of micro-credit and green micro-credit
Key informant interviews	10 key informant interviews
Participant observations	Over a period of 4 months
Focus group discussions	4 focus group discussions
Small workshops	1 event

**Source: Field data, Hakaluki Haor, 2010**

### **2.5.1 Household Interview with Semi-structured Questionnaire**

The questions asked in the semi-structured interview are content focused, and deal with the issues and areas judged by the researcher to be relevant to the research questions (Dunn 2005). The most important information in research comes from semi-structured interviews if one knows what to ask and whom to ask (Pido et al. 1996). Semi-structured interview is organised and ordered, but flexible, questioning. A household sample survey has the capacity to yield detailed information at the household, individual, or even population level from a relatively small sample. Since a quantitative household survey can be standardized, information may be comparable between field sites (Ellis 2000).

I selected 31 households for the household questionnaire survey, all of which have been micro-credit and green micro-credit borrowers of CNRS (Figure 2.4). I usually

went to their house when both husband and wife were available. In some cases, I made an appointment with them at their convenient time, so they had no rush in answering my questions.



**Figure 2.4: Household Interview, Hakaluki Haor, 2010.**

Among the 31 households, 7 households were female-headed and 24 of them were male-headed households. Some of the questions were “yes”/“no” type questions. For example, “Have you got training for the use of green micro-credit?”. Some of the questions were computed by ranking exercise. I provided the males and females with a set of 8 choices of livelihood activities to rank their priorities in the use of green micro-credit. Data were calculated according to their priorities, from first priority to last priority.

### **2.5.2 Key Informant Interview**

The purpose of the key informant interviews is to collect information from a wide range of people including community leaders, professionals, or residents who have firsthand

knowledge about the community and local institutions (Chambers 1994a). In the study, participants were identified from diverse stakeholders who ranged from poor borrower to micro-credit field manager of CNRS, member in any local micro-enterprises, individual who has reputation in the community as a knowledge holder, and member in any women's saving group. Figure 2.5 shows one key informant interview with a CBO member.



**Figure 2.5: Key Informant Interview, Hakaluki Haor, 2010**

Ten key informant interviews were conducted by supplementing semi-structured questionnaire. This data collection procedure enabled me to understand the social norms, culture and networks, livelihood of the people, motive of community people on green micro-credit initiatives, their concern about caring for the environment, and their opinions on the potentiality of green micro-credit initiatives.

### **2.5.3 Focus Group Discussions**

“A focus group is a series of discussions designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment” (Krueger and Casey 2000). The specialty of focus group discussions is that the researcher listens not only for the content of focus group discussions, but also emotions, ironies, contradictions, and tensions. This enables the researcher to learn or confirm not just the facts, but the meaning behind the facts. It also requires that the researcher redirect the conversation if it moves too far from the research topics (Dunn 2005). It assists in identifying problems and portrays them, what is happening in their world that facilitators may not see from their own world view (Morgan 1998). In this way, focus groups elicit information that paints a portrait of combined local perspectives (Duncan and Marotz-Baden 1999). Madriz (2000) asserts:

“FGDs can be an important element in the advancement of an agenda of social justice for women, because they can serve to expose and validate women’s everyday experiences of subjugation and their individual and collective survival and resistance strategies.....”

Prior to organizing a FGD (Figure 2.6), I spent sufficient time with the group to develop a sense of intimacy and trust. The meeting places and timing were set according to their schedule. The participants were entertained by tea, sweets, and cookies. I conducted 4 focus group discussions over the 4-month period (Table 2.4). The open-ended questions provided valuable insights into the communal opinion about green enterprises, what problems the borrowers faced in repaying loans, and what could be done for the successful implementation of green micro-credit.



**Figure 2.6: Focus Group Discussion with Nonua *Mahila Samiti***

**Table 2.4: Events of Focus Group Discussions**

No	Group composition	Time
1	8 female members of Nonua Mahila Samiti	25 <sup>th</sup> September 2010
2	8 female members of Pabijuri Mahila Samiti	15 <sup>th</sup> October
3	6 members of green micro-credit projects	15 <sup>th</sup> November
4	6 members of green micro-credit projects	15 <sup>th</sup> December

**Source: Field data, Hakaluki *Haor*, 2010**

#### **2.5.4 Participant Observation**

“Participant observation involves getting close to people and making them feel comfortable enough with your presence so that you can observe and record information

about their lives” (Bernard 2002). Data collected by participant observers are descriptive, such as field notes, photographs, audio recording, open-ended interviews, etc (Spradly 1980; Mosse 2001). During my field study, I gathered valuable information only by observing them very closely. Activities such as attending biweekly meetings of women groups with NGO personnel, in-house chatting, and walking through the village in the early morning when the farmers and fishermen used to start their day, were all very insightful for my research. Participant observation gave me the opportunity to develop an understanding about borrowers’ livelihoods, barriers to sustain green enterprises, gender issues in the community, and the community’s perception about green micro-credit.

### **2.5.5 In-house Chatting**

Informal discussion among village women was held at leisure times at someone’s house (Figure 2.7). It is a unique cultural phenomenon in rural Bangladesh. This in-house chatting is an everyday entertainment for women and has become a part of their daily life. Women in the area have limited entertainment opportunity and restricted mobility. In-house chatting is the way where they exchange information, share their problems, and household financial crises, and seek solutions from other fellow women. Becoming a part of in-house chatting with them was very effective in gathering information about community peoples, their motives, values, beliefs, interests, and awareness about green micro-credit. After spending a couple of weeks with them, I realized that women have two free times in a day when they informally chat with neighbour women at any comfortable place. They have one free time either in the morning (at around 10:30 to 11:30), just after sending their kids to school, and after lunch (at around 3 to 4 pm). I spent hours with them at those times. Women maintain a harmonious relationship with

other women. They were very open in sharing their problems and sought suggestions from educated women. After returning from the field site, I noted my experiences and observations that seemed relevant to my research objectives.



**Figure 2.7: In-house Chatting, Hakaluki Haor, 2010**

### **2.5.6 Small Workshop**

Small workshop is an informal information session with a target population with a view to validating important information gathered from individuals (Chamber 1994a). This process makes the research findings less open to criticism. I arranged one small workshop with the participants, CNRS staff, and CBOs to verify my collected data and gather feedback from them. I provided the community people with a primary report of the research outcomes. All the formal feedback from the workshop touched on gaining important insights and learning about the community.

## **2.6 Secondary Data Sources**

The physiographic description of the study area was collected from different secondary data sources, including previous research projects of CNRS, government reports, maps, aerials photographs, articles, and books. Different national and international projects have been operating at the Hakaluki *haor*, for a long since. Different government organizations, local and international NGOs, and researchers have documented their work and findings in the form of literature, evaluation reports, and project reports. Theoretical and experiential contributions of the researcher under different projects on Hakaluki *haor* are also used as secondary data in this research.

## **2.7 Ethical Consideration**

As the research followed a participatory approach, participant's involvement was required in every stage of data collection procedure. Any principal investigator is required to apply for the ethics approval to conduct any research involving community people. I applied to Joint-Faculty Research Ethics Board (JFREB) to get the human ethics approval to conduct the research and my ethics application was approved on July 26, 2011. I conducted interviews, focus group discussions, participant observations, and case studies. The research was conducted by taking participants' verbal and written consent. Audio recording for household interviews, focus group discussions and key informant interviews were done by making them aware about the data collection procedure. The copy of the approval letter is attached in Appendix ii.

# Chapter Three

## Role of Micro-credit and Green Micro-credit in Creating Livelihood Options



**Plate 3: Commercial Fisherman with a Pull-net and a Basket Full of Fish**



**Plate 4: Green Micro-credit Borrower with a Sack of Paddy (rice) Seed**

### **3.1 Introduction**

In Chapter 3, I discuss the findings from my second objective: the role of micro-credit and green micro-credit in creating livelihood options. This chapter starts with a detailed institutional background of micro-credit, CNRS's conventional and green micro-credit operations, and how green micro-credit can create livelihood options. I discuss borrowers' characteristics, socio-economic characteristics of the borrowers' households, characteristics of commercial and subsistence fisheries, and how people make a living in the area. The chapter deals with conventional micro-credit first because it is the conventional micro-credit holders who have moved to green micro-credit as that option became available. For the purposes of this thesis, having livelihood options means having more than one income-earning opportunity.

### **3.2 Institutional Background of Micro-credit**

In 2006, the Nobel Peace Prize was awarded to Muhammad Yunus (and Grameen Bank) for pioneering the idea of micro-credit, the first micro-finance institution (MFI) in Bangladesh. The Grameen Bank evolved from a research project aimed at identifying causes of poverty, carried out by Dr. Mohammad Yunus. The research found out that capital constraints had been forcing women to sell their handicraft products to input providers at prices that were much lower than market prices (Bornstein 1996). Dr. Yunus concluded that small-scale capital, which was lacking in rural areas, is necessary for income-generating activities. That experience led him to experiment with a loan program targeted at poor people without collateral. In 1983, through a government statute, the Grameen Bank became an official financial institution (Chowdhury et al. 2005). It is now

regulated by the Central Bank of Bangladesh, and is the largest player in the micro-credit sector.

The Grameen Bank employed the group-lending model. Each group is formed of five people with similar socio-economic status (usually from the same village). Each member presents himself or herself as a guarantor of other members' loans. This system of "joint liability" replaces the traditional collateral system used in the formal financial sector. If any member defaults, the whole group becomes ineligible to receive any further loans. In this sense, each member of the group is responsible and liable for other members' repayment of loans. Loans are repaid in weekly instalments, (with each instalment being equal to 15-20% on the principal) (Chowdhury et al. 2005). Grameen Bank started providing micro-loans to both men and women, but since the 1980s it has focused primarily on women (CDF 2005; Schurmann and Johnston 2009).

In Bangladesh, about 95% of micro-credit clientele is women (Grameen Bank 2009; Schurman and Johnston 2009). Usually the first loan is very small; ranging from 3000 to 5000 taka. If the group or the individual client can fully repay the principal amount on time, then they are eligible for taking further loans. Women from vulnerable households were the main target groups of micro-finance NGOs. Yunus (1999) recalled how he had to struggle to convince the eligible women to accept credit. The rural women would not go in front of him because of the "purdah" norms. So Yunus ended up talking with women with a screening between them. Moreover, they were reluctant to accept credit because they did not know what to do with it. The rural women were taught that money was something that should be handled by men only.

In Bangladesh, the role of micro-credit has been found to strengthen crisis-coping mechanisms, diversify income-earning sources, build assets, and improve the status of women (Montgomery et al. 1996; Hashemi et al. 1996; Morduch 1998; Morduch and Halley 2001). Micro-credit programs in rural Bangladesh have played an important role in creating livelihood options through enhancing entrepreneurship activities and self-employment (Pitt and Khandker 2002). Micro-credit programs are expected to have two impacts: 1) poverty reduction and 2) women's empowerment. I will discuss the women's empowerment impact in Chapter 4. Pitt and Khandker (1998) claim (based on their study of 1,800 households with 7-8 years follow up) that micro-credit in Bangladesh has positive implications to lift its borrowers out of poverty. Recent research of Khandker (2005) asserts that micro-credit has a positive spill-over effect at the local level. Imai et al.'s (2008) study on micro-finance and household poverty reduction in rural India finds that the rate of poverty reduction is significant when the borrowers use the loan for productive purposes rather than consumption purposes.

Some of these NGOs experimented with the Grameen Bank micro-credit delivery system at the beginning and gradually they developed their own micro-credit operation systems such as the Bangladesh Rural Advancement Committee (BRAC) and the Association of Social Advancement (ASA).

### **3.3 CNRS: An Environmental NGO**

In Hakaluki *haor*, CNRS started its activities with a wetland conservation project in 1992 funded by Bangladesh government. In 1998, CNRS first implemented its community-based *haor* resource management program under the sustainable environmental

management program (SEMP) funded by UNDP (1998-2006). Since then, CNRS has successfully implemented 22 projects related to wetland resource management and conservation. Along with developing participatory resource management plans, CNRS is working to promote a framework for sustainable livelihoods and a healthy environment for local communities. Many project participants are still following the conservation activities that they learned from the conservation projects. For example, CBOs and women's self-help groups (i.e., Nonua *Mahila Samiti*) were formed during the CBFM-2 project. These groups are still involved in road-side plantation which was a part of the CBFM-2 project. CNRS did not aid micro-credit services during its first year. In 1998, the very poor of Sunamganj requested that CNRS could include a credit scheme in addition to its conservation activities.

CNRS is mainly a service provider for its project participants. Projects are financed through the related project funding structure (e.g., SEMP, CBFM-2). After about 10 years of micro-credit operations in Hakaluki *haor*, CNRS realized that some activities were environmentally damaging. For example, farmers were using chemical fertilizers to increase their yields. This practice led to degradation of aquatic habitat due to agro-chemical pollution from agricultural lands. They wanted to earn as much as they could during the short rice cropping season (dry season rice). Another example is how some commercial fishermen used micro-credit to buy current nets which could capture very young fish (CNRS 2007) (Figure 3.1). Some poor people started hunting migratory birds and waterfowls. Caught birds were either eaten or sold in local markets as a source of additional income. It is found that limited opportunity for alternative sustainable

livelihoods is one of the key factors in the degradation of *haor* environments (CWBMP 2005).



**Figure 3.1: A Group of Fishermen Bought a Large Fish Net by Taking Micro-credit**

Some of these observations became part of the reason that CNRS started to get into green micro-credit. There are two types of loan programs operated by CNRS: conventional micro-credit and green micro-credit. In Hakaluki *haor*, CNRS has been operating its conventional micro-credit schemes with women’s self-help groups and CBOs. CBOs include both men and women. In January 2010, CNRS first commenced green micro-credit initiatives in Nonua-Pabijuri with an aim to ensure sustainable use of natural resources by providing the borrowers with micro-credit. The term “green micro-credit” was first used by Dr. Haque. Green micro-credit should have three characteristics (Haque 2006):

- Develops small-scale enterprises that are environment friendly
- Uses renewable natural resources and the environment in a sustainable manner

- Promotes eco-friendly livelihood options.

### **3.4 How Green Micro-credit can Create Livelihood Options**

Livelihoods “comprise the capabilities, assets, and activities required for making a living” (Chambers 1992). Having a diversity of livelihood options is necessary for rural households to respond to stress and shocks (Ellis 2000). Livelihood literature focuses on the fact that poor people adapt livelihood options to make their livelihoods function smooth in the context of their own locality (Ellis 2000). Households having a range of livelihood options can reduce the chances of vulnerability and reduce the year-round income fluctuation (Niehof 2004; Mendola 2008). In rural agrarian economies, having livelihood options is necessary to fulfil household demands during the pre-harvest period or prepare households for any anticipated natural calamity (Ellis 2000). Niehof (2004) distinguishes that diversification of livelihood options depends on access to three types of resources: human resources (i.e., skills, knowledge), material resources (i.e., credit, transportation facility), and environmental resources (i.e., land, markets).

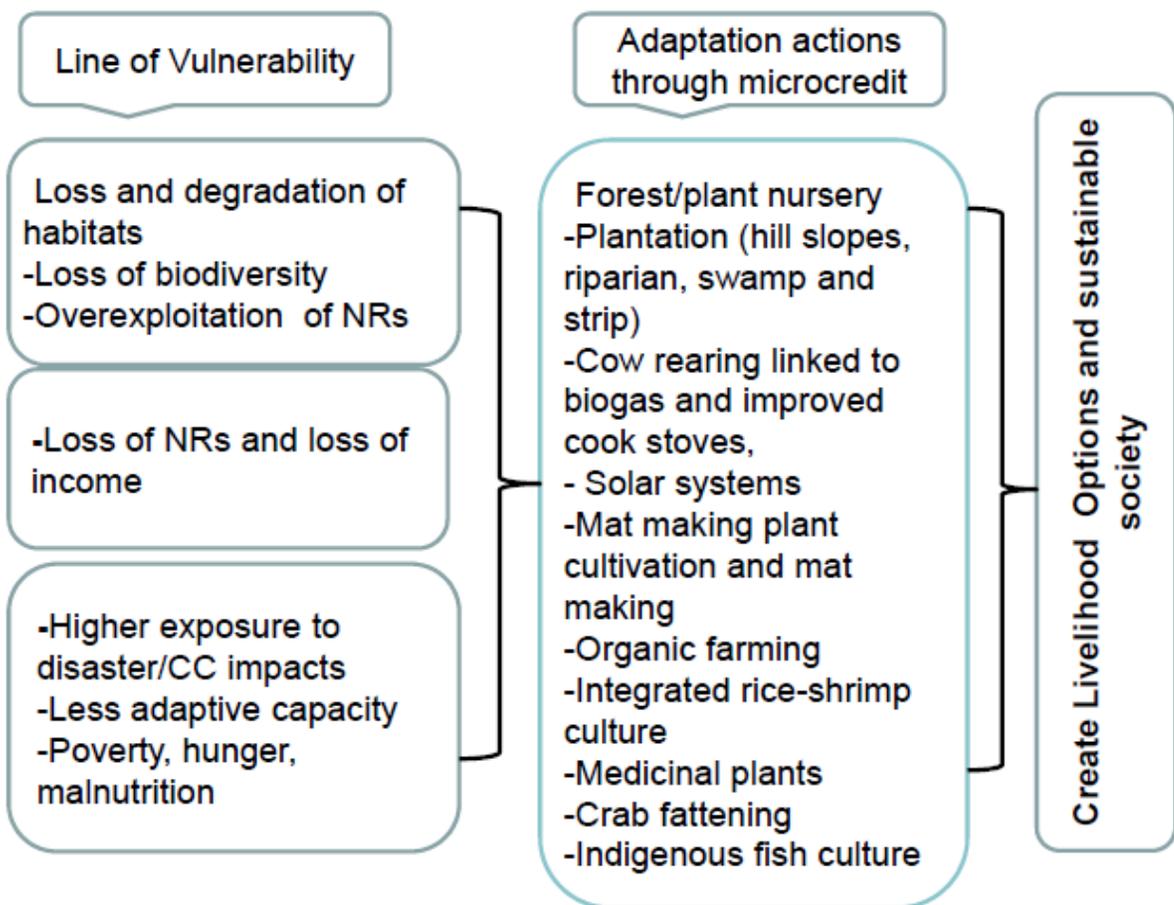
Agarwal (1997) states that village commons are important sources of livelihood and basic necessities for rural households in developing countries especially for women, who own little private land for their critical survival. Community forestry in India is successfully marketing its forest products (timber and non-timber) through practicing sustainable use of forest resources. Commercialization of local natural resources (i.e., forest products, fisheries) through developing local enterprises has gained momentum in many parts of the world (Scheer and Kaimowitz 2004; Craig and Potter 2006). In everyday life, rural communities are extremely dependent on natural resources for living,

especially when income, foods, or animal fodder are scarce (De Beer and McDermott 1996; Craig and Potter 2006). In many cases, unregulated and natural resource-based livelihood activities are responsible for environmental degradation. For example, in Hakaluki *haor*, dwellers cut swamp forest to obtain wood for cooking purposes (CNRS 2002).

Wang's (2000) study in rural China suggests that providing rural people with more alternative sources of income can keep them from exploiting local natural resources. Recent studies of Uddin (2011) in Hakaluki *haor* find that a majority of people make some kind of livelihood by using natural resources. The hypotheses for developing green enterprises are: (1) alternative sources of income can reduce the pressure on *haor* resources, and (2) women's empowerment and sustainable use of *haor* resources can be done by providing the borrowers with micro-credit. There are about 200,000 people living in and around Hakaluki *haor* and dependent on *haor* resources for some kind of income-generating activities (Choudhury and Faisal 2005). Rabby et al. (2011) states "the poor of Hakaluki *haor* are doing agricultural activities, and side by side developing out various income-generating activities to sustain livelihood. *Haor* people earn from land, water, biodiversity, and reed forest to sustain livelihoods." Intensification of agriculture and depleted fishery resources are examples of people's extreme dependency on *haor* resources. According to VCGs, poor people are clear cutting flooded (swamp) forest because some of the trees provide very good fuel wood and some of them are used as medicinal plants.

Creating more livelihood options can reduce the unsustainable use of *haor*/wetland resources such as swamp (flooded) forest resources. For example, two bird hunters in the

area quit hunting as other livelihood options became available to them through micro-credit. Figure 3.2 presents a list of threats on *haor* resources and some livelihood options to mitigate the degradation of the *haor* environment. The livelihood options are identified by the potential green micro-credit borrowers. Green enterprises are expected to launch businesses that generate incomes, reduce environmental impacts, and improve lives of local communities.



**Figure 3.2: Expected Role of Green Micro-credit in Creating Livelihood Options and Environmental Sustainability (adopted from CNRS 2011)**

### 3.5 How Conventional and Green Micro-credit Loan Programs are Operated by CNRS

In 1998, CNRS started its conventional micro-credit operations by following the “group-lending model” of Grameen Bank. Gradually, CNRS has developed its own financial system for credit operation and loan delivery. The operational and management process of conventional and green micro-credit differ in terms of their purpose of loan, loan size, repayment duration, and interest rates (Table 3.1).

**Table 3.1: Conventional and Green Micro-credit Characteristics**

	<b>Conventional micro-credit</b>	<b>Green micro-credit</b>
Purpose	Open to invest in any purpose	Must invest in eco-friendly livelihood activities
Loan size	3000 to 20,000 taka at first time borrowing, second loan will be higher than first time borrowing.	10,000 to 100,000 taka at first time borrowing, second loan will be higher than first time borrowing.
Interest rate	15%	15%
Installment frequency	Weekly	Monthly installment with one-month grace period
Loan repayment due	Within 40 weeks	Within 12 months

**Source: Field data, Hakaluki Haor, 2010**

Conventional micro-credit is provided for livelihood improvement and income generation with no particular condition for caring the environment. Green micro-credit is only granted for developing eco-friendly enterprises. In CNRS’s conventional micro-credit, weekly installments begin immediately after the loan is processed. The interest rates

charged by CNRS are 15% on its principal amount for both conventional and green borrowers.

In green micro-credit, the clientele is given a one-month grace period before the installments begin. Loans are granted for either individual or group-based activities and the loan sizes vary according to the project, ranging from at least 10,000 taka to more than 100,000 taka at first phase (Table 3.1). In 2010, CNRS made an exception with respect to the monthly repayment schedule for green borrowers. Nearly seven months of prolonged flooding made the green borrowers unable to do any income generation from enterprises. CNRS took only the principal amount from green-borrowing households.

At the inception of any project, the branch manager visits villages and forms groups with 15 to 20 people (both men and women or sometimes only men or only women) in each group. These borrowers may not all be interested in loans, but their membership is required to guarantee collateral for actual borrowers. Members are required to submit a proposal to the project manager, outlining the purpose and plans of taking a loan. Loans are granted by considering borrowers' capability to generate income, borrowers' knowledge, physical assets, social bonding with other members, and monthly income of the applicants. The same process is followed in the case of individual borrowing. The community facilitator collects money and writes the transaction in a log book, which is signed by all members (Figure 3.3). Figure 3.4 shows the process-outcome model of green micro-credit operation.

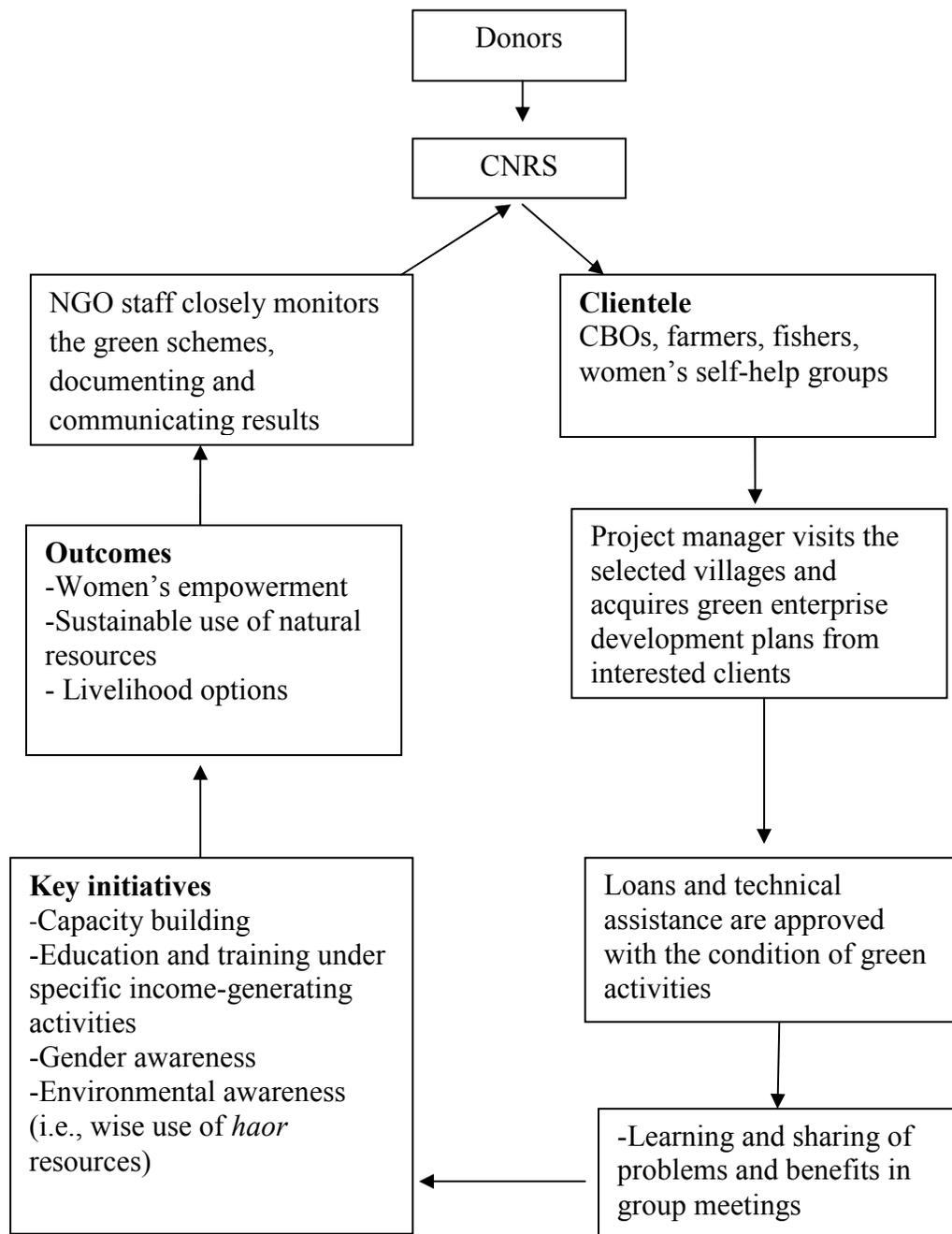


**Figure 3.3: Credit Collection (left) by an NGO Staff; Bi-weekly Meeting (right) of Women's Self-help Group**

Any borrower is required to open a deposit book with 45 taka which includes 5 taka to cover the cost for the passbook and 20 taka for the group saving fund. Borrowers receive training in bookkeeping, managing funds, and livelihood activities upon loan approval. Once groups are formed, a group leader is selected to be responsible for maintaining accounts and bookkeeping. Ensuring repayment is on-time allows the borrowers to keep group membership and take further loans in the future.

### **3.6 Why Borrowers Prefer Conventional and Green Micro-credit in the Study Area**

Private banking and state-owned banking requires collateral for giving a loan. For eligible borrowers, the typical bank rate in Bangladesh is 10-12%. The poor are left outside the purview of banks as they are unable to provide collateral. Micro-credit NGOs are one of the possible sources of financing for the poor in rural Bangladesh. There are some other sources of money such as *Mahajons* (money lender).

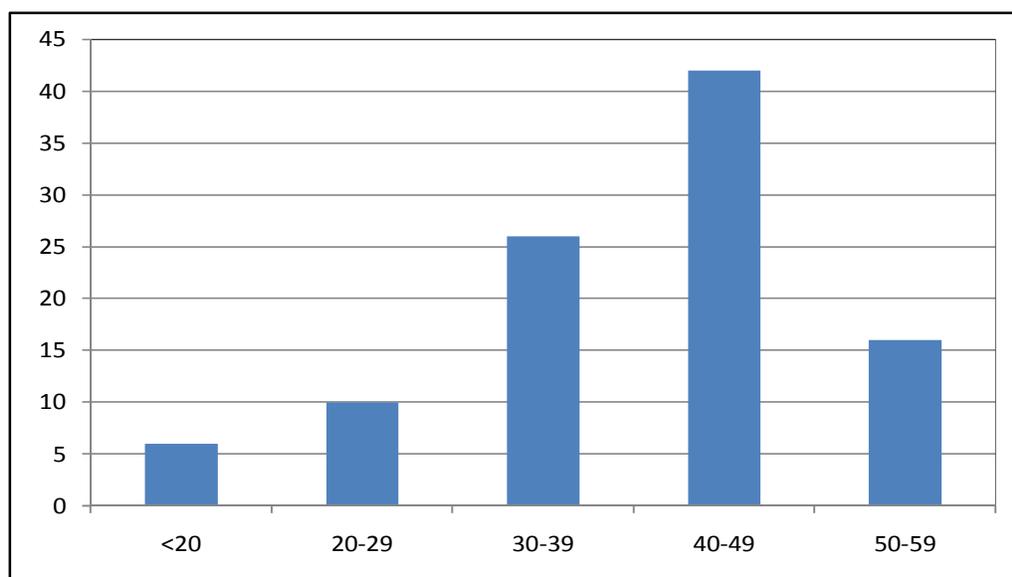


**Figure 3.4: The Process-Outcomes Model of Green Micro-credit Operation**

*Mahajons* typically charge 90-120% per annum on the principal amount. Local NGOs provide small loans with the lowest interest rate compared to other sources. CNRS charges a 15% interest rate on the principal amount, other NGOs (i.e. Grameen Bank) charge 20-30%, and village cooperatives charge 30-40%.

### 3.7 Characteristics of Borrowers'

#### 3.7.1. Borrower's age characteristics



**Figure 3.5: Age-structure of the Borrowers.** Data Include both conventional and green micro-credit

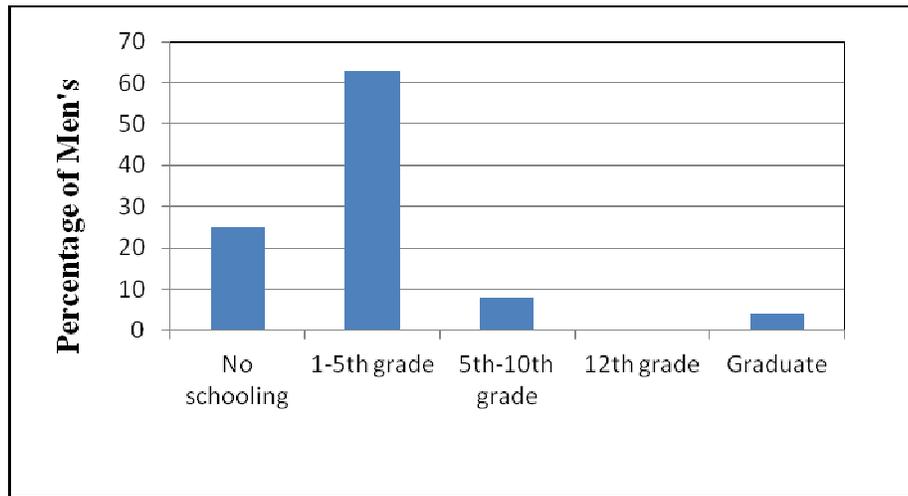
The total number of households surveyed was 31. A total of 55 respondents were selected, among them, around 57% were female respondents while 43% were male respondents. About 42% of the borrowers were within the age group of 40-49 and 26% of them were aged between 30 and 39 years (Figure 3.5).

### 3.7.2. Religion of the borrowers'

Nonua-Pabijur is a Hindu-dominated area. Ninety percent of the people are Hindu by religion and 10% of them are Muslim.

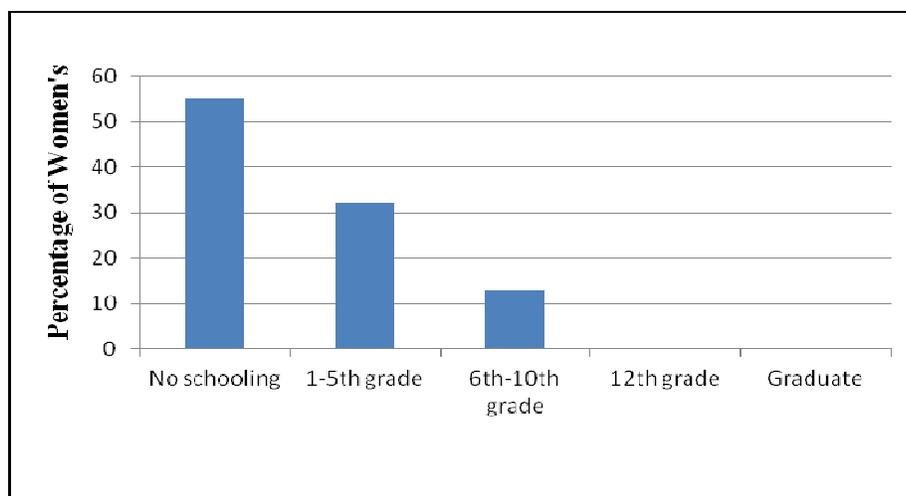
### 3.7.3 Borrower's educational attainment

The level of education of the respondents ranged from no schooling to graduate. Men's educational attainment is higher than women's (Figure 3.6 and 3.7).



**Figure 3.6: Educational Status of Men (N=24)**

No schooling means when the person does not have any reading and writing skills. By analysing the educational status of men and women, it is postulated that about 55% of women have no schooling compared to 25% of males (some of them know how to sign their names and some of them do not). Nearly 63% of the males passed the primary level of education (1st-5th grade) whereas 32% of females completed their primary education. Secondary school attainment is 13% and 8% for males and females, respectively. No female attended at 12th grade education. Noticeably, only one graduated male is found.



**Figure 3.7: Educational Status of Women (N=31)**

### **3.8 Borrowers' Household Characteristics**

The study area represents typical shanty character of rural areas of Bangladesh. Poor household conditions in the village not only reflects the unprivileged socio-economic condition of the borrowers but also shows the devastation of natural flooding that appears at the entire *haor* every year. As the *haor* floods annually, habitations are clustered along its slightly raised fringes. The main reason for staying together is to cooperate with each other in livelihood activities in times of crises. During monsoons, small manual boats and locally popular *vora* (a platform made of bamboos or banana tress tied together with bunch of ropes) are the only means of physical communication from one settlement to another. Most of the people use sun grass (as thatching material) for making rooftops, and mud and bamboo are used for making walls of houses (Figure 3.8).

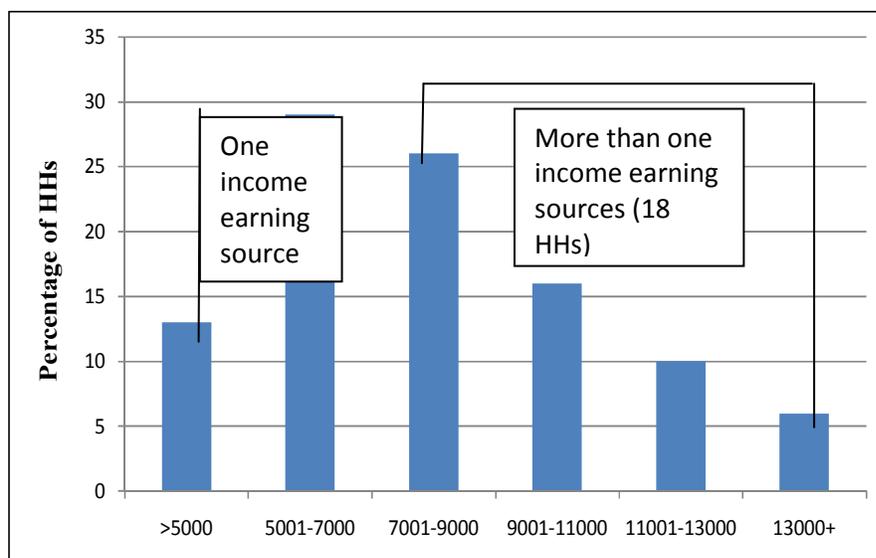
None of the houses are brick-made, except for 3 semi-buildings (the roofs are made of tins and walls are brick-made). The kitchen is usually seen inside the house, but during the dry season female members of the households prefer open cooking. Most of the households have sanitary latrines within their household premises but a little far from the main home.



**Figure 3.8: A Typical House of the Study Area**

### **3.8.1 Household Income**

Household income in the area includes total cash earnings per month. The estimation represents an approximate amount (dependent on borrowers' information). Farmers earn more in the dry season, fishers earn more during monsoon. The income level ranges from 5000 taka to more than 13,000 taka (Figure 3.9). About 13% of the households have monthly income below 5000 taka. These households are mostly female-headed households.



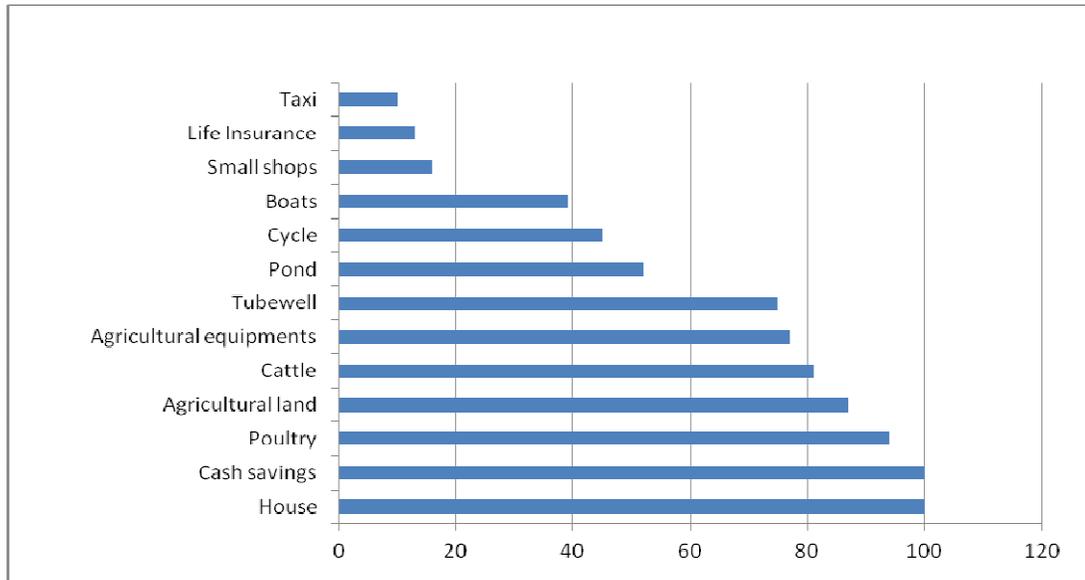
**Figure 3.9: Average Monthly Household Income (N=31) of the Borrowers?. Values in taka.**

About 39% of the households have an average monthly income between 5000 to 7000 taka. These are farming families who depend on one income-earning source, *boro* rice cultivation. A majority of this group (5000 to 7000 taka income group) use their micro-credit for consumption purposes rather than investing in productive purposes. I have found that these borrowers mostly use the loans for foods, pre-natal and post-natal care, house repairing, and sending sons to a Middle East country.

About 26% of the households earn 7001 to 9000 taka per month. Approximately 16% of the households have income ranging from 9001 to 11000 taka. About 10% of the households earn 11,001 to 13,000 taka. Interestingly, these households have more than one income-earning source. For example, Mrs. Jharna Chakrabarty, the head of *Nonua Mahila Samiti*, has 4 types of income-generating sources, such as agriculture and vegetable cultivation for the dry season, vegetable shop for the monsoon, and cow rearing

for throughout the year. In the village, about 6% of the households have the highest income (more than 13,000 taka). These households are commercial fishers and have fish-related businesses such as fish drying, fish frying, boat-making, and fish netting.

### 3.8.2 Household Assets



**Figure 3.10: Household Assets of the Borrowers’**

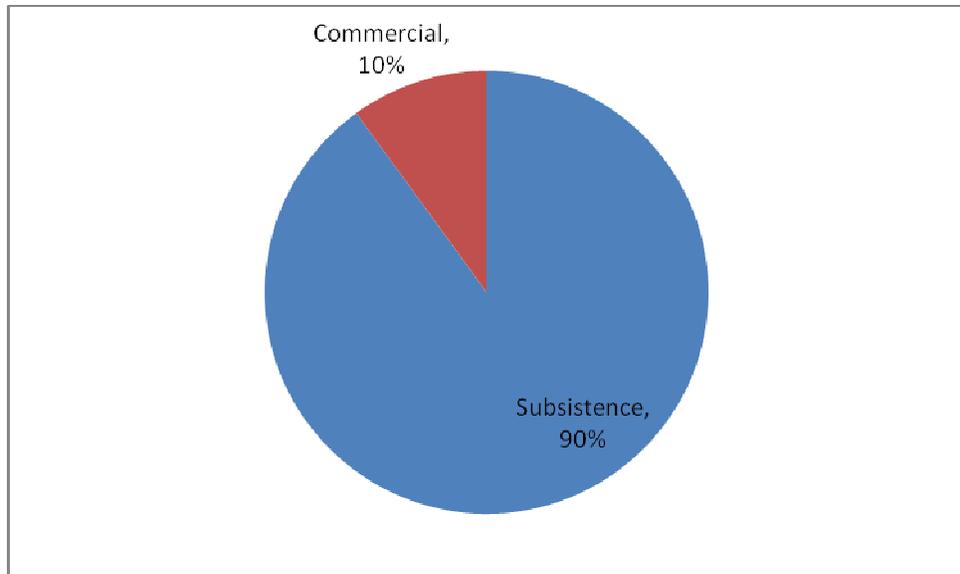
All of the respondents have house and cash savings in CNRS (Figure 3.10). In focus group discussions, respondents indicated that no matter how small the savings were the women could use the money whenever the family was in need of money. About 94% of the households have poultry (chicken or duck), 81% of the households have cattle (cows or goats), and 87% of the households reported having agricultural lands. About 78% of the households own single or multiple sets of agricultural equipment (hoe, water pump, etc.). About 75% of the households have their own tube well within household premises. The rest of the households (25%) collect drinking water from neighbours. Almost half of

the total households possess bi-cycles which is an indicator of wealth in rural areas. About 39% of the households have small wooden boats for using during floods.

A total of 16% of the households have small shops at the local market. Out of the 31 households in my study, I found only 17% houses were using solar-powered electricity from Grameen Shakti. I found 12% of the total households have opened an account for life insurance and about 10% of the total households have a CNG taxi that they purchased by using loans. It is important to mention here that households having more than one income earning source enjoy more assets and household facilities than single income-earning groups. For example, cycles, ponds, and small wooden boats, solar powered electricity, small shops, and taxis are seen in the 7000 to 13,000 taka income earning group (Figure 3.9).

### **3.9 Characteristics of Fishery**

In the study area, only 10% of the total households are commercial fishers who fish all year round. These fishers are less dependent on agriculture for their livelihoods (Figure 3.11). Subsistence fishers (90% of the total borrowers) are mostly farmers (Figure 3.12). Many of the commercial fishers in Bangladesh are caste-based Hindu fishers (i.e., they are defined as fishers by caste), but in my study, all of the fishers in the area were Muslim. Gender differences in fishing are greatly observed. Women are totally excluded from catching fishes directly. Fish drying, fish netting and fish boat-making are handled by women. Fisheries management in *haor* has been a national and local issue for the past 30 years.



**Figure 3.11: Commercial vs. Subsistence Fishers**

Commercial and affluent fishermen lease out the *beels* with the help of politically influential persons and catch fishes throughout the year. Unequal access to fishery resources drives up the rate of poverty in wetland areas. According to villagers, small-scale fishers' inability to catch fishes not only adversely impacts fishers' families, but



**Figure 3.12: A Farmer Catches Fish for Subsistence**

also affects dry fish producers, ice sellers, catchers, fish choppers, ancillary traders, and other dependent groups.

### **3.10 How the Households Make a Living in the Study Area**

I have been a fisherman for 40 years. I took my first loan from Grameen Bank in 1992 to buy fishing gears. Fishing is my life and I cannot even imagine myself without holding nets in hands and smell of fishes out of my body. I always had handsome income for my family but the situation started changing in the last 15 years. The fishermen, like me, neither have alliance with political parties nor with influential persons. Taking lease of *beels* is beyond my capacity. I am allowed to do fishing only during floods. Two of my sons followed my occupation as well. We used to cultivate vegetables for our own consumption. In 2007 my elder son migrated to Middle-East as my monthly income as a fisherman was not sufficient to meet the needs for the family. My second son catches fish during monsoon, grows vegetables in winter and also works as seasonal construction worker whenever needed. Now a day we really can't depend on only fishery.

(Riazuddin, 55-year-old, Pabijuri, 2010)

Agriculture and fisheries are the two main livelihood options in the study area.

Riazuddin's comments demonstrate how a variety of livelihood options can ensure household financial security. At Nonua-Pabijuri, along with agriculture and fisheries, people now engage in a variety of activities for income generation. I have listed the activities according to dry and wet season as all activities are greatly shaped by seasonality (Table 3.2).

Farmers get only one cropping season (*boro*) which makes their households financially vulnerable for the rest of the year. Most of the farmers, especially landless and sharecroppers do subsistence fishing for household consumptions. People need to earn enough to meet their household demand over the lean periods. Sometimes farmers and fishermen migrate to nearby cities to work as wage labourers during lean periods.

**Table 3.2: Dry and Wet Season Occupations in the Study Area**

<b>Dry season occupations</b>	<b>Wet season occupations</b>
Rice cultivation Livestock rearing (cows, goats) Poultry Fish net Dry fish Mat and handicraft making Cultivate <i>murta</i> plants Homestead vegetable cultivation Wage labour (i.e., agricultural labour, construction worker) Services Carpenter (cane furniture) Van/rickshaw/auto taxi Small businesses (i.e., hotels and restaurants at local markets, grocery shops, selling fuel woods) Tourism Remittance Religious activities Forest guard (village conservation group)	Commercial and subsistence fishing Ferry Fish net Dry fish Mat and handicraft making Wage labour (i.e., agricultural labour, construction worker) Small businesses (i.e., hotels and restaurants at local markets, grocery shops, selling fuel woods) Carpenter (cane furniture) Aquatic non-fish resources collection Services Remittances Tourism Religious activities Forest guard (village conservation group)

**Sources: Field study, Hakaluki Haor, 2010**

Making fish net, dry fish, livestock and poultry rearing, and homestead vegetable cultivation are mostly done by women. These secondary occupations are important to

ensure household consumption demands are met. Eco-tourism can be a potential business in the dry season. Nature-loving people visit *haor* for watching migratory birds, recreational fishing, boating, and having picnics. Some young males work as guides for seasonal tourists. CNG taxi drivers, as well as rickshaw and van-pullers earn extra money than their regular income in winter.

In the study area, about half of the total households use some kind of micro-credit. Twenty five households were found using conventional micro-credit and six households use green micro-credit. Households use the micro-credit for various purposes, as detailed in Table 3.3. About 40% of the borrowers, mostly farmers, report that repaying installments is a challenge for them. The situation gets worse if any natural calamity (i.e., flood) happens. I asked the members how they would be able to repay installments just after the devastating flood in 2010. Some of the households borrowed money from Women Self-help Group leaders, some of them migrated outside of the village to work as wage laborers and some of them used their savings from NGOs. While attending the bi-weekly meeting with Nonua-Pabijuri *Mahila Samiti*, I saw four borrowers borrowing money from the group leader to pay their weekly installments. On the contrary, 2010 was a good year for the fishers. According to the fishers, “we are going to build brick-houses this year”. The rest of the total households (60%) have been good credit risk as they have multiple sources of income.

**Table 3.3: Uses of Conventional and Green Micro-credit loans in the Study Area**

Conventional	Green
<ol style="list-style-type: none"> <li>1. Rice cultivation</li> <li>2. Medical treatment</li> <li>3. Sending sons to Middle East for wage-earning</li> <li>4. Small businesses (grocery shops or tea stalls)</li> <li>5. Fish trade</li> <li>6. Buying fish nets</li> <li>7. Marriage ceremony of sons and daughters</li> <li>8. Children's education</li> <li>9. Constructions or repair houses</li> <li>10. Repaying loan to other micro-finance institutions</li> <li>11. Food purchase</li> <li>12. Celebrate Eid or Pujah</li> <li>13. Buying CNG taxi, rickshaw, and van (3-wheelers)</li> <li>14. Cow fattening</li> <li>15. Livestock rearing for consumption</li> <li>16. Poultry farming for consumption</li> </ol>	<p><b><u>Ongoing</u></b></p> <ol style="list-style-type: none"> <li>1. Organic vegetable cultivation</li> <li>2. Livestock rearing</li> <li>3. <i>Murta</i> mat and handicraft</li> <li>4. Dairy food products</li> <li>5. Aquaculture (started in 2011)</li> </ol> <p><b><u>Potential uses</u></b></p> <ol style="list-style-type: none"> <li>1. Organic paddy cultivation</li> <li>2. Plant nurseries</li> <li>3. Poultry farm</li> <li>4. Non-mechanized boat</li> <li>5. Agro-forestry</li> <li>6. Road-side plantation</li> <li>7. Bio-gas</li> <li>8. Compost</li> <li>9. Solar panel</li> <li>10. Dry fish</li> <li>11. Rice processing</li> <li>12. Floating cultivation of seasonal vegetables</li> <li>13. Making fish net</li> </ol>

**Sources: Field data, Hakaluki Haor, 2010.** Borrowers may choose to invest in more than one income earning sources.

### 3.11 Some Success and Failure Stories of Borrowers

My study revealed that the more livelihood options households have, the less vulnerable they are to crises. Three cases are discussed below:

**Case 1:** Sameer Das, 47-year-old, passed secondary level of education, Nonua, 2010. Sameer Das is a farmer. Das took his first loan from CNRS in 2005 and invested the money (3000 taka) in rice cultivation. Das's first investment was profitable and paid back the loan on time. Das took his second loan in 2006, worth of 10,000 taka. With the second loan, he purchased a small store for starting a restaurant at the nearby market.

However, Das could not start his business because he had to spend the loan for his wife's treatment. Later on, Das had to sell some agricultural lands to pay weekly instalments. In 2008, Sameer took a third loan, worth of 12,000 taka and run restaurant business again. His wife made sweets such as *jilapi*, *nimki*, *rosogolla* for his store. Besides making sweets, his wife and daughter made *murta* mats to earn extra money for his family. Das's wife used that money for children's education. According to Sameer "Since I have started the food business, my family's financial security is ensured. I did not have to worry about repaying weekly instalments. I would not be able to get back on my feet without the third loan". Das's family is earning about 7000-8000 taka per month. The family also saves some money for children's education and medical treatment for family members. The couple realized the importance of savings when his wife fell sick in 2006. Das's three kids are attending schools and the eldest son (20 years old) has successfully passed grade 12<sup>th</sup> in 2010. Das was planning to apply for an aquaculture loan as his son has acquired training on aquaculture from Ministry of Fisheries, Government of Bangladesh.

**Case 2:** Jharna Chakraborty is a 52-year-old female, passed 5<sup>th</sup> level of education and group leader of Nonua *Mahila Samiti*. There are nine members in her family including her husband, two sons, sons' wives and three grand-kids. Inherently, her family got some crop lands. She could not use the land due to lack of capital. She took her first micro-credit loan in 1992 from Grameen Bank, worth 3000 taka. She and her husband used that loan for rice cultivation and to buy some poultry. She also used it to grow vegetables for household consumption. She was very regular in repaying weekly instalments. In 1994 and 1996, she took two more loans from Grameen Bank. She used the loans for cultivating rice and to buy some agricultural land including a pond. In 1998, she became a CNRS client. Her first loan was 10,000 taka. She bought two cows and one bullock. The bullock was used to plough lands. She started livestock rearing along with vegetable cultivation while her husband was doing rice cultivation. This kind of work ensured her household food security and reduced her daily expenditures.

According to Chakraborty, "I started increasing money flows, reduce expenditures and increase household assets. I saved at least a penny overnight. I realized a change in my family. I started participate in decision-making regarding household expenditure and investing micro-credit. Neighbours also respected me. Still I am a well-respected woman in the community. While struggling with flood and drought, I have learnt that I need to have more income earning sources to ensure household financial security. I have a harmonious relationship with CNRS. I mobilize the whole community on behalf of the NGO whenever they need to arrange meetings or workshops or trainings. I have been taking micro-credit for 18 years. Wise and appropriate use of credit, keeping track of expenditures can bring success."

In 2002, Chakraborty took another loan from CNRS worth 18,000 taka. With it she rented a vegetable shop at the local market. She grew vegetables and her sons sold vegetables at markets. Even though they were a farming family, she always had 4 to 5 types of income sources at the same time. Chakraborty has never has been a loan defaulter. She is a successful entrepreneur and mentor for the community people. In 2009, she shifted into the green micro-credit scheme. With four other male members, she joined in organic vegetable cultivation and animal husbandry enterprise. During the prolonged flood for over 6 months in 2010, her family survived through the support of green micro-credit enterprises.

**Case 3:** Tunu Rani Das, age 48, no educational attainment, Pabijuri, 2010.

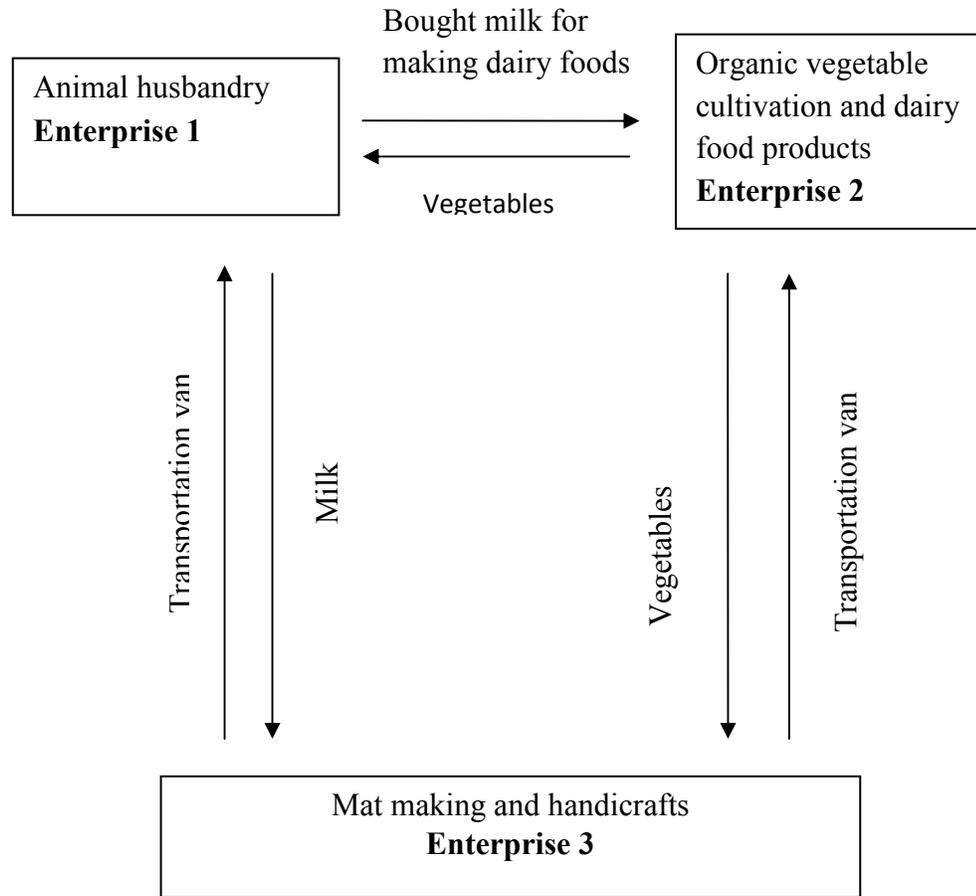
Tunu Rani Das has been a micro-credit client with CNRS for 10 years. She has three sons; the eldest son (age 30) is a wage labour, the younger son (age 26) is a construction worker and the youngest son (age 22) is unemployed. The couple took the first loan, worth of 3000 taka in 2001 from CNRS and invested the loan for growing rice. They were successful to repay the loan within one year. Tunu's husband died from heart attack in 2003. Tunu's financial condition started to fall after her husband's death. Tunu spent a lot of money on her husband's treatment by taking loans (total 20,000 taka) from neighbours, relatives and *Mohajons* (local money lenders). She had to sell some of the agricultural lands to repay her loans. She took a third loan (10,000 taka) in 2006 from CNRS for her eldest son who wanted to run a grocery store at the local market. Unfortunately, the business was not successful. Her two sons did not bother to pay her loans.

Since then Tunu started making *murta* mats to supplement household income. She did not have any pieces of lands left but the house; even she could not cultivate vegetables for subsistence. The borrower was facing difficulty to market mats as she was not allowed to go to market by herself. Tunu cannot make more than three floor mats in a month due to high prices of *murta* plants. For surviving, she sometimes works as wage labours; does subsistence fishing and sometimes she collects firewood from forest. The borrower is responsible to pay back more than 10,000 taka while her monthly income is less than 2000 taka.

**Case 4:** Three green micro-credit enterprises in 2010.

The research finds that the green enterprises are organized, innovative and capable of managing their crises. I will discuss the green enterprises in detail in Chapter 5. Here I analyze how the green borrowers survived during the devastating and abnormal flood in 2010 (Figure 3.13). Green enterprises started with six members in 2010, all of them were from farming households. These six farming families depended on *boro* rice for their livelihoods. Now these farming households are expanding their livelihood options with green micro-credit support. The growing season of *boro* extends from December to the end of April or early May. In 2010, harvesting of *boro* was hindered by early monsoon flooding that remained in the area for nearly six months. None of these six green borrowing families were able to get any production from *boro* fields. Agricultural lands and houses were fully submerged for two months (August to early October). Before the organic vegetable fields were damaged by flood water, the borrowers managed to harvest 75% of the total produce. These six members supported their families through income

from green enterprises. These three enterprises exchanged and shared their benefits with each other (Figure 3.5).



**Figure 3.13: Food and Benefit-sharing Among Green enterprises**

Organic vegetable entrepreneurs kept some of their products for consumption and also shared with the other two enterprises. When the organic vegetable fields were submerged by flood water, dairy food product enterprise (owner Ranjit Das) was thinking about how he could make some money. He and his wife planned to use the cow milk from the organic agriculture and animal husbandry enterprise (Enterprise 1). At the same time Enterprise 1 was having difficulty associated with preserving, transporting, and selling

milk. Enterprise 2 saved Enterprise 1 by buying cow milk. Enterprise 3 was in the most miserable condition as they could not get *boro* rice for family consumption. Enterprise 1 and Enterprise 2 shared their products with Enterprise 3. In exchange, Enterprise 3 helped the other two enterprises with the transportation van (three-wheeler) that was granted by CNRS.

### **3.13 Conclusion**

Chapter 3 assessed the role of micro-credit and green micro-credit in creating livelihood options for the borrowers. My study determined that most of the people in Nonua-Pabijuri depend on micro-loans for their survival. Micro-credit has profound impacts on borrowers' livelihoods through livelihood diversification, increment of household income, and increasing the number of household assets. Analysis of case studies reveals that success from income earning sources depends on how individuals are using micro-credit and green micro-credit. Micro-credit is not a panacea; rather it is intimately linked to a set of multiple socio-economic and cultural factors. In Chapter 4, I will discuss the findings from my second research objective.

## Chapter Four

### Women's Priorities in the Use of Green Micro-credit



**Plate 5: A Female Borrower Works in her Vegetable Garden**



**Plate 6: A Farmer is Preparing Seed-bed for *Boro* Rice**

## 4.1 Introduction

In this chapter, I will discuss the findings from my second objective: to identify women's priorities in the use of green micro-credit and to identify the factors that can constrain (or facilitate) women's participation in decision-making related to obtaining and using green micro-credit. Women's empowerment can be evaluated through their role in decision-making at the household level. As my sample size for green micro-credit was small (6 households), I used both conventional and green micro-credit borrowing households for my data analysis. I expect that green micro-credit borrowers will have similar impact as the conventional borrowers. Micro-entrepreneurship activities are of increasing importance for women's empowerment through income earning and improvement in family welfare supplemented by micro-credit (Bryceson 1996; Hulme and Mosley 1996; Ellis 1999; Bryceson 2000). My study links green micro-credit and women's empowerment in three ways: (1) micro-credit programs focus on women's empowerment and women's livelihood improvement through entrepreneurship activities, (2) rural women in developing countries mostly make their livelihoods by using natural resources and (3) women have indigenous knowledge to nurture and take care of the natural environment.

In Bangladesh, like men, women have access to *haor* resources for making livelihoods, but their nature of uses and conservation practices can be different. Identifying women's preferences in using green micro-credit is necessary for developing entrepreneurship activities for them. Green schemes intend to develop a framework considering women's preferences, barriers, and benefits. It is expected that women's involvement in green

enterprises will have positive implications in sustaining the natural environment. Many times it has been proved in Bangladesh that rural women can effectively manage natural resources; some examples are asserted below:

Ahmed et al. (2008) find that in *haor* areas many women are involved in agricultural pre and post-harvesting activities, fish processing, and collecting of aquatic plants and non-timber forests products. As women are not directly involved in operating fish catch, they do not have any decision-making power regarding fisheries. Surprisingly, despite having fewer rights to participate in decision-making, women are still willing to conserve natural resources (i.e. limiting forest product harvest).

Sultana and Thompson (2008) provide similar findings: after involving women in *beel* management committee in floodplain Bangladesh, fish species diversity appears to have increased and incomes from aquatic resources have substantially increased. Compliance and acceptance with fishing limits are higher where both men and women play an active role in decision-making or where men advised or endorsed decisions than in sites where women play no role. For example, in Goalkhola beel, from 1997 to 1998 to 2001 to 2002, five fish sanctuaries were protected in every dry season and early monsoon. Women guard the ponds during day time and men do at night.

Women have a great deal of indigenous knowledge in recognizing fish species in floodplain and coastal areas in Bangladesh. Women's role in fishing still remains unsung due to gender-based occupation practices in Bangladesh (Dev 2011). Similar findings come from Barman's study (2001) in north-west Bangladesh: many women take part in the application of manure for fish culture and exercise some authority in the selection of fish species, but have little control over income from fish resources. Moreover, a lack of

ownership from fish income, limited training facilities in aquaculture, and social and cultural factors are undermining their active participation in aquaculture. Understanding women's preferences to manage natural resources is proven helpful in many countries because women's preferences relate to their household well-being (Oakley and Momsen 2005). From time immemorial women protect natural resources to ensure household food security. In developing countries, women are mainly responsible for securing food, and fuel for their families and this situation specifically applies to female-headed households (Agarwal 1992; Marchant 1995). Moreover, women have knowledge of different forest resources, the multiple uses of crops, soil features, and health care for livestock (Shiva 1989; Agarwal 2001; Agarwal 2009; Agarwal 2010). As Sudan (2007) asserts:

Women are often able to play an autonomous role in livelihood diversification by undertaking their own small-scale enterprises. The participation in innovative enterprises is often advocated as an important means to promote rural women's empowerment and more equitable gender relationship within the households.

Agarwal (2009, 2010) states that by only acknowledging women's preferences in natural resources management cannot guarantee women's empowerment, rather their participation has to be valued and active in the decision-making process.

#### **4.2 Women's Empowerment and Micro-credit**

Before presenting results relating to green micro-credit, section 4.2 discusses the literature under three headings: first, conceptualizing empowerment; second, how micro-credit empowers women; third, what the rationale is for targeting women, and; fourth, what the results are of assessment of the impact of micro-credit.

## **Conceptualizing empowerment**

The notion of empowerment has been used in a variety of ways. Different literature defines women's empowerment differently. Kabeer (1999, 2001) defines empowerment as women's ability to make choices. According to UN (2008), women's empowerment should have five components: (1) women's sense of self-worth, (2) right to have and to determine choices, (3) right to have access to opportunities and resources, (4) right to have the power to control their own lives, and (5) their ability to influence the direction of social change, nationally and internationally. It is really hard to estimate the appropriate level of women's empowerment even when women have freedom of choices and economic self-sufficiency (James and Trail 1995; Kabeer 1999; Kabeer 2001). It is quite possible for some dimensions to improve while others do not or even get worse. As a result, different studies may conceivably come up with conflicting findings depending on which dimension they happen to focus on. Any empowering effect from micro-credit may well be different for different women, depending on their individual and other characteristics (McElroy 1990). According to Rowlands (1997), the time dimension is very important, because the empowering effect can take considerable time to take root in a staunchly patriarchal society. As a result, studies that look at a longer time horizon may find an empowering effect that those with a shorter horizon may not.

It is important to mention how and what dimensions of the notion of empowerment is being used in the literature. For the purposes of this research, women's empowerment means to involve women in income-generating activities and to increase their decision-making power at the household level. Benefits of micro-credit are principally related to

the livelihood roles of women, rather than simply their gender (Emdad Haque, personal communication).

### **How micro-credit empowers women?**

It is speculated that women's access to credit can empower them within and outside the home. This can happen in two ways: first, when women contribute cash income to the household that is supposed to give them greater bargaining power within the household (Osmani 2007). Household activities, however important they are, do not bring as much prestige and recognition as does the earning of cash income. So when micro-credit enables women to earn cash income for the family, it immediately raises their self-esteem as well as their esteem in the eyes of others. Second, in the process of taking loans and using it in income-earning activities, women have to come out from the narrow confines of households' precincts and mingle with the wider world (Kabeer 2001; Kabeer 2005). This exposure to the world, and in particular the formation of networks with other women in the community, is expected to give them the self-confidence and courage they need in order to exercise more power both within the household and within the larger community.

### **What is the rationale for targeting women?**

The rationale for providing women with micro-credit has been argued differently by different scholars. Studies show that repayment is regular and on-time when women become borrowers (Hashemi et al. 1996; Pitt and Khandker 1995; Premchander 2003). Pitt and Khandker (1998) find that the flow of consumption expenditure increases 18 taka for every 100 taka borrowed by women, but only 11 taka for every 100 taka borrowed by

men. Almeyda (1996) states that unless women specifically targeted; they face social, cultural, and economic restrictions that further limit their access to credit compared to men. Women-headed households are usually more vulnerable in times of crises, as they have fewer resources to draw upon. Vulnerable households are those that are unable to smooth consumption in the face of fluctuation of income due to crop diseases, floods, illness and other idiosyncratic shocks to the household. In addition to generating incomes from the loans, borrowers and their neighbours receive indirect and intangible benefits.

Women's control over financial resources has a positive impact on their families' nutrition, education, and health (Pitt and Khandker 1998; Khandker 2005). Steel (1998) found that women's increased income has a positive impact on children's education. Purchasing stationeries for children's education also benefits local vendors. When rural household incomes are lifted it often leads to increased local economy. Participation in micro-credit programs is associated with positive health behaviours and outcomes as well (Levin et al. 2001). Kabeer (2001), and Imai and Annim (2008) assert that repayment rates on loans and contributions to family well-being are often higher when credit goes to women rather than men. Moreover, recent empirical work of Fletschner (2008) demonstrates that women's credit constraints have a negative impact on their household economies. Female borrowers tend to use loans for the well-being of their families (Carter and Katz 1997).

### **What are the results and assessments of the impact of micro-credit on women's empowerment?**

Recognising women's empowerment by micro-finance initiatives means more than targeting a program towards women. It is meant to uplift women's position in the

society, household, and local community. However, micro-finance is no more blessed than any other intervention with the ability to correct the power imbalances which result from inequalities in the way society treats men and women (Fletschner 2008).

Most recently, evaluations of micro-credit programs in women's empowerment have been divided into two parts with some evaluations claiming extremely positive results while others suggest that micro-credit leave women worse off than before. Sujata's (2010) findings from India suggest that the loans do not permanently move participants out of poverty; however, they do reduce some of the vulnerabilities associated with poverty. Goetz and Gupta (1996) find that the majority of women, particularly married women, exercise little or no control over the loans. The scholars suggest three possible repayment scenarios, all with negative implications for women. In the first, husbands use the loan and take responsibility for loan repayments. In the second, men are unable to supply the repayments and women clientele have to substitute funds from other sources (drawing on their savings, cutting back on consumption, and other assets). In the third, men are unwilling to repay the loans, leading to an intensification of tensions within the household, often spilling over into violence. In some cases, violence against women is exacerbated by the frustration of husbands at the wives' delay or failure in accessing credit. Facilities to enhance women's access to the market is put forward by the authors as the most effective way of enhancing their control over loans, as well as their public presence and their self-confidence.

In her study in Bangladesh, Ackerly (1995) concludes that women's access to the market is the primary route for their empowerment. Ackerly finds that women who

provide labour to loan-assisted enterprise, sell their own products, or keep their own accounts are likely to be empowered.

Montgomery et al., (1996) found that only 9% of first-time female borrowers are primary managers of loan-funded activities while 87% described their role in terms of “family partnerships”. By contrast, 33% of first-time male borrowers have sole authority over loan-assisted activity while 56% described it as a family partnership. The interpretation is that male dominance in decision-making is disguised as “family partnerships” of credit control. The authors conclude that access to loans has done little to empower women. The main effects of micro-credit have been to increase the social status of loan-receiving women within their household or the wider community.

A longitudinal case study of Pit and Khandker (1995) concluded that women’s preferences and household decision-making carry greater weight where they received a loan compared to households where no loans had been received. The results of their research came by including the value of women’s non-land assets, the total hours worked per month for cash income by men and women within the household, the education of children, as well as total consumption of expenditure.

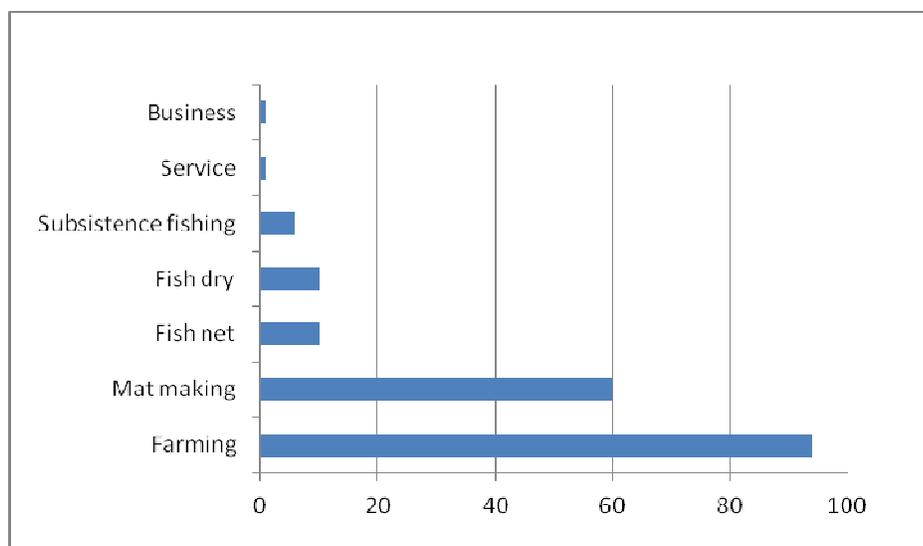
Hashemi et al., (1996) explored the impact of credit on eight indicators of empowerment: (i) women’s economic contribution, (ii) mobility in the public domain, (iii) ability to make small purchases, (iv) ability to make large purchases, (v) involvement in major decisions, (vi) participation in public protests and political campaigns (vii) freedom from family domination, including the ability to make choices concerning how their money was used (a say in decisions relating to the sale of their jewellery or land) or in taking up outside work, and (viii) political and legal awareness. They found that access

to credit significantly increased women's capacity in holdings assets in their own names, increased their exercise of purchasing power, and their political and legal awareness. Their study also found that BRAC clientele tend to report higher levels of mobility and political participation while Grameen members report higher involvement in household decision-making related to kids, household expenditures, etc. The scholars argued that access to credit appeared to be associated with an overall reduction of the incidence of violence against women.

It is speculated that the multifaceted approach adopted by MFIs has a larger effect on any society in terms of achieving Millennium Development Goals (MDGs). The eight goals of MDGs are: (1) poverty and hunger reduction, (2) universal primary education, (3) women's empowerment, (4) gender parity, (5) improvement of maternal health, (6) reduction of child mortality, (7) combating diseases (e.g., HIV/AIDS, malaria), and (8) environmental sustainability. Financial and social empowerment of the poor especially women's empowerment is crucial to achieve the MDGs (Mahjabeen 2008). Garikipati's (2008) study on micro-credit programs in India find that loans given to women are mainly diverted into production and consumption needs of their households. Due to lack of authority over family assets, women are unable to divert income from household productive purposes towards repayment. Her study suggests that if women's lack of control over family assets is not challenged, then micro-credit may fail to live up to its promise towards empowerment.

#### **4.3 Women's Livelihood in the Study Area**

Figure 4.1 represents that a total of 94% of respondents in this study are engaged in some kind of farm activities.



**Figure 4.1: Women’s Livelihood in the Study Area (N=31).** Data include both general and green micro-credit. Participants may choose more than one.

In Nonua-Pabijuri, women’s livelihood is mostly natural resource-based. Women’s low educational attainment, lack of life-skill sets, and lack of wage employment opportunity have made them dependent on local natural resources. Farm activities include agricultural activities (seed bed preparation; sowing, planting, transplanting; harvesting and threshing; winnowing, parboiling, drying, storage, drying and preservation of straws), homestead vegetable cultivation, and livestock rearing.

Women’s contribution of labour in farm activities may not directly bring cash income but these types of activities increment household income through reducing labour costs and food expenditures. Demand of family protein and necessary vitamins are supplied from home-based vegetable gardens and, poultry and cow rearing. Women’s farming activities ensure daily food for their family. About 59% of the women make *murta* mats (*Shital pati*) as a means of alternative livelihood options. All female-headed households depend

on mat making for livelihood. About 9% of the total respondents do fish dry and fish net as they are from fisher families. Only 1% of the respondents do service and business. About 6% of the women do subsistence fishing, and they are widows. Female-headed households are found to be the most vulnerable households in the study village. Widows catch small fishes in the wet season and dry them for eating all year round.

#### **4.4 Gender-based Priorities in the Use of Green Micro-credit**

##### **Women's priorities in the use of green micro-credit**

“I have four kids to take care of who are aged between 2 to 10 years. I always prefer to work from home. I have invested my loan in vegetable cultivation and making dairy food products such as yogurt. I make the dairy foods at night when my kids sleep and during day I help my husband in the vegetable garden. I am teaching my elder son how to cultivate and grow vegetables.”

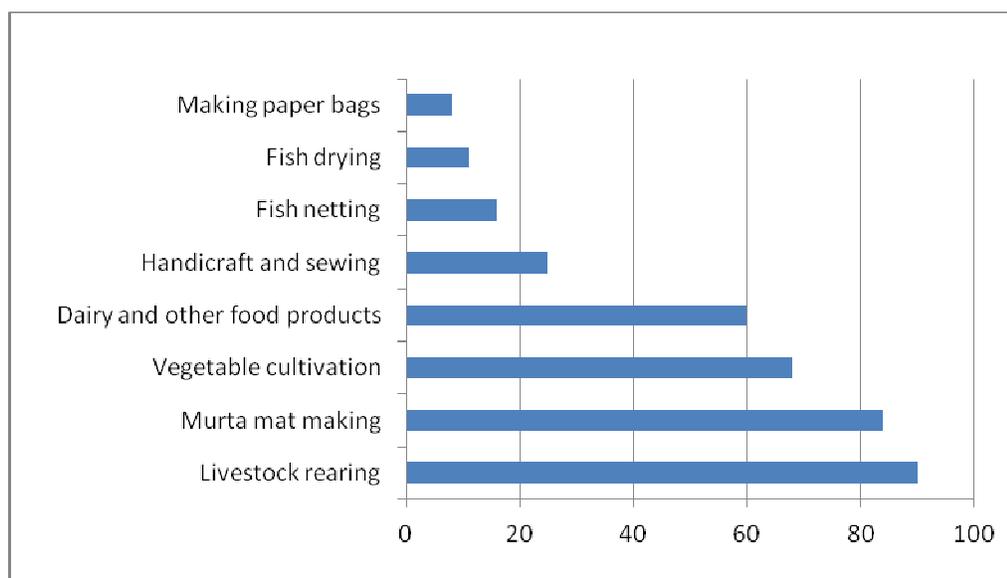
(Anita Das, Hakaluki *haor*, 2010).

“Whenever I take money, I first think how I will pay the instalments on time. I am a widow and my two sons are migrated construction workers. I always prefer the income sources which can give me back quick profit such as mat making, paper bag making or grocery shop at the local market”.

(Gita Rani Das, Hakaluki *haor*, 2010).

The above quotes and Figure 4.2 clearly show that women's preferences in investing green micro-credit are focused on home-based income-generating activities. Here livestock includes cows, poultry, and goat rearing. Livestock rearing appeared as the first priority option in investing green micro-credit. Livestock ensures daily protein for the family members, are easy to take care of, and cows can sell quickly in times of any financial crisis. Cow traction and single ox-plough are still very popular and convenient for poor farming families in rural Bangladesh. About 84% of the females prefer mat making. The reasons behind preferring *murta* mats are that Hakaluki *haor* is naturally

rich in indigenous *murta* plants, which is widely used for making mats, baskets, and handicrafts. Another reason is that women can make mats by staying at home and their husbands sell the mats to the markets, thus the transaction costs of products are minimized.



**Figure 4.2: Women’s Priorities in the use of Green Micro-credit (N=31)**

**(Respondents may choose more than one).** Data include both general and green micro-credit.

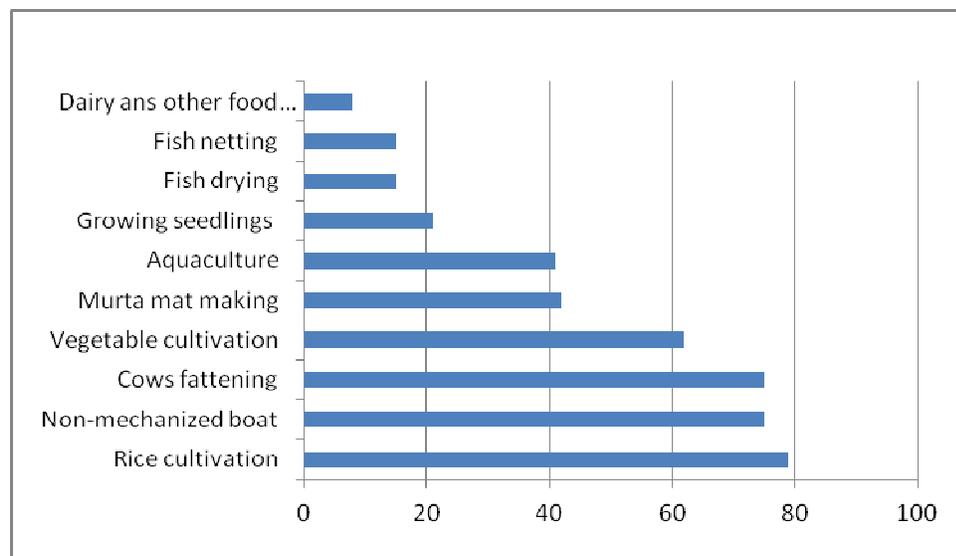
A considerable proportion of borrowers (68%) prefer vegetable gardening. After using household consumptions, the surplus vegetables can be sold. A total of 60% of women prefer making dairy and sweet foods, such as yogurt, *puri*, *jillabi*, and *rosgolla*. Handicraft and tailoring (preferred by 25% of all women) are prioritized by comparatively young women. Handicraft means small cane baskets, and wall and floor mats. Only fishers’ families prefer fish net (9%) and dry fish (9%). Only 9% of the women prefer making paper bags.

### Men's priorities in the use of green micro-credit

It is very hard to prioritize income-earning activities as I always have to switch my occupations depending on seasons and availability of work. I am a farmer. Following this year's flood situation, many people are now thinking to invest micro-credit to buy small mechanized boats. This year those earned a handsome amount of money who owned boats.

(Jitendra Das, Pabijuri, Hakaluki *haor*, 2010).

Figure 4.3 shows men's preference in the use of green micro-credit. Rice cultivation is the first preference (79% of the total respondents) for investing green micro-credit by men. Surprisingly, about 75% of the total respondents report non-mechanized boat as the second preference.



**Figure 4.3: Men's Preferences in the Use of Green Micro-credit (N=24).** (Respondents may choose more than one). Data include both general and green micro-credit. Two options, non-mechanized boat and dairy and other food products were added by the male participants.

Boats are considered life saving devices during the wet season because family members and domestic animals can be moved to safer places. Moreover, using the boat as a ferry

business can ensure at least some daily income. About 75% of the respondents report cow fattening as their third preference. More than half of the respondents (62%) prefer vegetable cultivation. Comparatively, young males and households with young sons (41%) preferred aquaculture. In the village, young men and women are now being given aquaculture training from the Ministry of Fisheries. About 21% of respondents prefer to sell paddy saplings because very recently there has been a shortage of on-time supply of *boro* seeds in the village. The respondents thought that growing paddy saplings could be a profitable business for them. Making fish net (10%) and fish dry (9%) are prioritized by fishers' families.

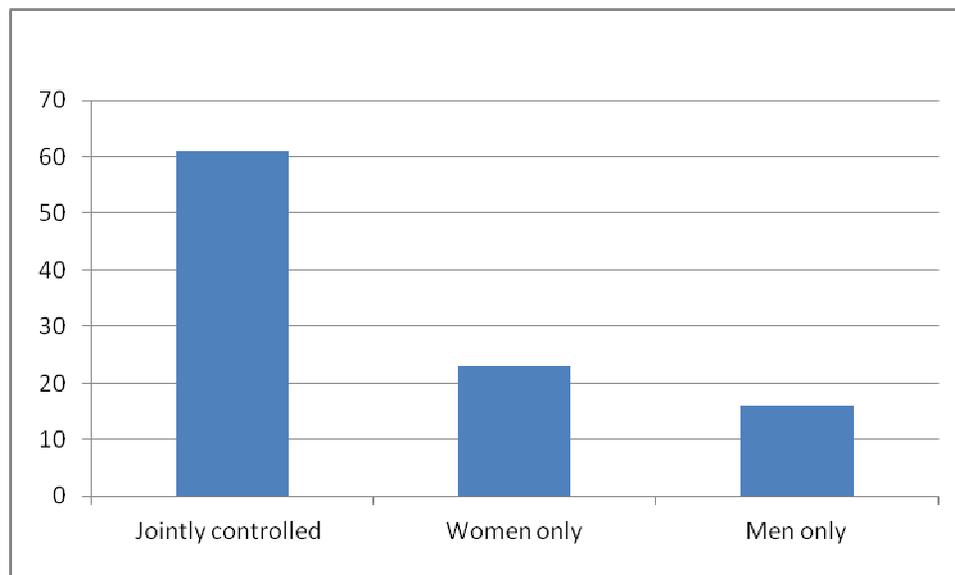
#### **4.5 Women's Empowerment Indicators**

Four indicators seem to be useful in understanding women's empowerment. These are: control over micro-credit (conventional and green), women's freedom of movement (local mobility), level of participation in household decision-making, and what women own. The indicators are analysed and discussed below:

##### **Who controls the micro-credit in the household?**

Control over micro-credit means who in the household has the authority to handle credit and profit from credit investments (Figure 4.4). Jointly-controlled means when both men and women make decisions in using micro-credit by mutual understanding. Women-only control means cases where men are excluded. Men-only control means cases where women are excluded. At Nonua-Pabijuri, about 61% of the households report to have a jointly-controlled micro-credit system (investment and expenditure), about 24% of the households claim to have a women-only credit control system, and about 15% of the households report to have a men-only micro-credit control system.

Women-only control system of credit applies to the female-headed households. Men and women uniformly suggest that jointly-controlled credit is preferable to them because it helps in two ways. Firstly, couples respect each other's opinions and this helps them in developing the sense of harmonious relations with family members. The absence of any divorced couples might suggest the social cohesion in the area. Secondly, due to patriarchal social structure, women experience restricted local mobility. Women who make mats and food products have help from their husbands in marketing the products.



**Figure 4.4: Who Controls Micro-credit in the Household.** Data include both general and green micro-credit.

My study reveals that the households experiencing jointly-controlled credit are better credit risk than women-only credit control and men-only credit control households. In a rural society like Nonua-Pabijuri, even women-control micro-credit systems cannot uplift the status of women. The percentages of women's educational attainment are very low in the area. Another factor is that borrowers are struggling with their livelihoods. Many of the households do not have the luxury of paying labour costs for agricultural activities. It

is the women who take care of crops and do all the post-harvest business. Female-headed households have to depend on their sons or neighbour male members for marketing their products. Sometimes female-headed households hire a middleman but that raises their business transaction costs, which minimizes profits.

**To what extent do women participate in household decision-making**

Participation in decision-making refers to the extent of women’s ability to participate in formulating and executing decisions regarding household matters in coordination with other family members. Data presented in Table 4.1 shows that all of the women (100%) are highly involved in decision-making regarding food stuff and stationeries purchases for children.

**Table 4.1: Women’s Participation in Household Decision-making (N=31)**

<b>Decision-making in the household</b>	<b>% of women</b>
Food stuff purchase	100
Stationeries purchase for children	100
Toiletries purchase	90
Poultry and cattle purchase/sale	60
Seeds sale/Purchase	58
Investment in small businesses	10
Land purchase/sale	6
Legal document signing	0
Fish business	0

**Source: Field data, Hakaluki Haor, 2010**

About 90% of the respondents are able to make decisions in toiletries purchases. Interestingly, only 6% of the women have authority to purchase and sell lands. Women have no involvement in signing legal documents and buying fishing equipment. Males

are in charge of major decision-making such as land purchases, fishing equipment purchases and sale, and signing of legal documents. Only 10% of the respondents have freedom to invest micro-credit in small businesses.

### **What Assets do Women have in the Household?**

Ownership of asset refers to the ability of a woman to have assets in her own name and enjoy benefits accruing from them. Regarding ownership of assets (Table 4.2), all the borrowers (100%) have cash savings in local NGOs which may increase their confidence level. Prior to being involved in micro-credit, women did not have these cash savings.

**Table 4.2: What Women’s Have in Their Own Name (N=31)**

Ownership of Assets	% of women
Cash savings	100
Poultry	81
Cattle	42
Goat	31
Land	23
Radio	19
Sewing machine	10
Three wheeler Van	1

**Source: Field data, Hakaluki Haor, 2010**

Women’s cash savings in the NGOs is an important indicator of women’s economic empowerment. Women can use the amount of money to get back on their feet after any kind of shocks (i.e., natural calamities, husbands’ deaths, and crop failures). Interestingly, only 23% of the total respondents have ownership of land in their own name. These 23% of women are widows; they got ownership of lands after their husbands’ deaths. The lack of land ownership has been deep rooted into the societal and religious constructions of

the society. Eighty-one percent of the women possess poultry, about 42% have cattle, and 31% have goats. Only 19% of the women have a radio. Radio is the only source for women to get information about the outside world. Only 10% of the respondents possess sewing machines while 25% of the women are interested in investing green micro-credit in sewing and handicraft making (Figure 4.2).

### **Women’s freedom of movement (local mobility)**

Freedom of movement means the extent of physical movement of women by themselves or with permission of their husband or senior member of the household for their education, training, earning, credit investments, meeting, and selling products. Table 4.3 shows all of the respondents can independently move to neighbours, cultural programs, and meetings within the village. About 70% of the total women are restricted to move outside the village without being accompanied by male family members.

**Table 4.3: Women’s Freedom of Movement (N=31)**

<b>Women’s Freedom of Movement</b>	<b>% of women</b>
Going to neighbours (on her own and accompanied)	100
Local market for shopping (on her own)	50
Local market for shopping (accompanied by family members)	100
Local market for selling business products ( neither on her own nor accompanied)	0
Cultural program with the village (on her own)	100
Meeting/Training outside village (on her own)	32
Meeting/Training inside village	100
Political meetings (neither on her own nor accompanied)	0

**Source: Field data, Hakaluki Haor, 2010.**

However, they can attend meetings and training outside the village while accompanied by husbands or male family members. Traditional socio-cultural norms and other safety issues in developing countries do not allow women to go outside of the village alone. Women's restricted mobility is impeding their entrepreneurship opportunity because women do not have direct market access to sell their products. One change attributable to micro-credit is being able to attend meetings and training outside of the village.

#### **4.6 Factors Impeding Women in Obtaining and Using Green Micro-credit**

Bangladesh is a conservative country with the majority of the population being Muslim in religion. Nonua-Pabijuri is a Hindu-dominated area; norms and restrictions regarding *purdha* are comparatively less than Muslim communities in the country. Still, there are some tangible and intangible socio-economic factors perceived in the study areas that are discussed below:

##### **Women's freedom of movement**

“I have a harmonious relation with my husband. We decide and spend money by taking each other's opinion. But when I said to him that I had to go to Dhaka to attend meetings and training programs with CNRS, my husband opposed. It does not mean that he is a bad husband but I am not expected to move without accompanying by any family member. After a long conversation, my husband agreed to let me go.”  
(Jhorna Chakrobarty, green micro-credit borrower, Hakaluki *haor*, 2010).

Jharna Chakrobarty has been a successful micro-entrepreneur as detailed in Chapter 3. Restrictions on her movement limit her opportunity to acquire life skill sets. Women's freedom of movement is necessary to make them capable of making their own choices, to change their disadvantaged position, and to improve their social network. Some of the preferences (Figure 4.4) in the use of green micro-credit need market access such as mat,

dairy food products, handicraft making, etc. Due to lack of direct market access, many women are facing difficulty when their husbands migrate seasonally for work. Female-headed households, especially those who do not have sons usually depend on neighbours or hire middle-men to sell their products. This process increases the transaction costs of marketing products and sometimes those households end up with a marginal profit.

### **Lack of skill sets and knowledge**

Women's low level of education, skill, experience, and knowledge impedes them to start some income-generating activities. As presented in Figure 3.9, a majority of women in the area still illiterate. Among 31 borrowers, only 12 women have been trained on green micro-credit initiatives such as organic farming and cow rearing. It is noticed that women do not have access to the same sources of information as men and are less aware of loans available to them and of the conditions for obtaining a loan.

Women's lack of mobility does not allow them to gather as much knowledge and information as men. In answering my question "what is green micro-credit to you?", about 60% of the male respondents were aware of the conditions and environmental concern of green micro-credit. The rest of the male respondents (30%) said that green micro-credit meant organic agriculture and composting or did not know anything about it (10%). On the other hand, 48% of the female respondents knew about the conditions and concerns of green micro-credit. About 21% of female respondents knew nothing about green micro-credit. The remainder (31%) of female respondents defined green micro-credit as organic agriculture.

### **Household-level barriers**

Household-level barriers refer to the constraints that women face from their families due to their responsibility of household chores, child care, and other domestic responsibility. Women report that they have 11 to 12 hours of domestic workload per day in the wet season and 14 to 15 hours of workload during the crop season. Usually villagers start their morning at 5 am and work until sunset except for taking a meal break at noon. It is interesting to note that women's household activities take more hours than men's work outside of the house does. From my intensive case studies, I have found that women usually need 11 to 12 hours in the wet season and 14 to 15 hours in the dry season to carry out their household chores and other responsibilities. Figure 4.6 and 4.7 shows a borrower's (Dipti) daily work. Daily working hours of women vary depending on the number of family members, availability of basic amenities and season.



**Figure 4.6: Dipti's Household Responsibility Figure 4.7: Dipti Works at Potato Field**

The absence of basic amenities such as electricity, water supply, and fuel make women's daily work hard. Interestingly, besides household responsibilities women concurrently take care of homestead vegetable gardens, prepare seedbeds for paddy cultivation, water vegetable gardens, and feed domestic animals. Through participant observations and focus group discussions, a list of women's daily responsibility is gathered in Table 4.4:

**Table 4.4: Women's Daily Household Responsibility**

- Prayer	-Winnowing/parboiling rice
- Watering plants	-Drying straws
- Preparing meals 3 times a day	-Taking care of elders
- Feeding domestic animals and husbandry	-Grazing cows/goats
- Sending kids to school	-Collecting grass for cows
- Cleaning houses	- Drying fish for consumption
- Washing clothes/dishes	- Vegetable gardening
- Fetching drinking water	-Agricultural activities
- Preserving seeds for next year	- Preparing seed beds

**Source: Field data, Hakaluki Haor, 2010**

### **Gender differences**

There are clear gender differences in livelihood activities in the study area. Women are excluded from operating fish business, rice cultivation, and other occupations that directly demand market access. In the area, women's livelihoods are based on home-based activities (Figure 4.1) and women have less livelihood options than men (Table 4.2). Widows are the most vulnerable due to gender based-labour distribution in the study

area. This research found 4 female-headed households whose primary occupation was once making mats, but their inability to market their product forced them to give up that business. Some female-headed households could not take loans even though they were potential entrepreneurs, because they are widows and they are not presented by male family members.

#### **4.7 Conclusion**

In chapter 4, I identified women's and men's preferences in the use of green micro-credit, analysed four indicators of women's empowerment, and identified the factors that can impede women in obtaining and using green micro-credit. Gender-based differences in prioritizing green micro-credit for livelihood diversification depend on various factors such as gender role at the household level and in society, knowledge and educational status of men and women, income-earning opportunities, seasonality, women's freedom of movement, access to knowledge and information, etc. In chapter 5, I will describe poverty, the environmental degradation and sustainability concept, the outcomes from the green enterprises in 2010, and discuss the barriers towards the sustainability of the enterprises.

## Chapter Five

### Green micro-credit in household well-being and environmental sustainability



Plate 7: Signboard of Mat and Souvenir Making Enterprise



Plate 8: Organic Vegetable Growing by Five-member Saving Group

## **5.1 Introduction**

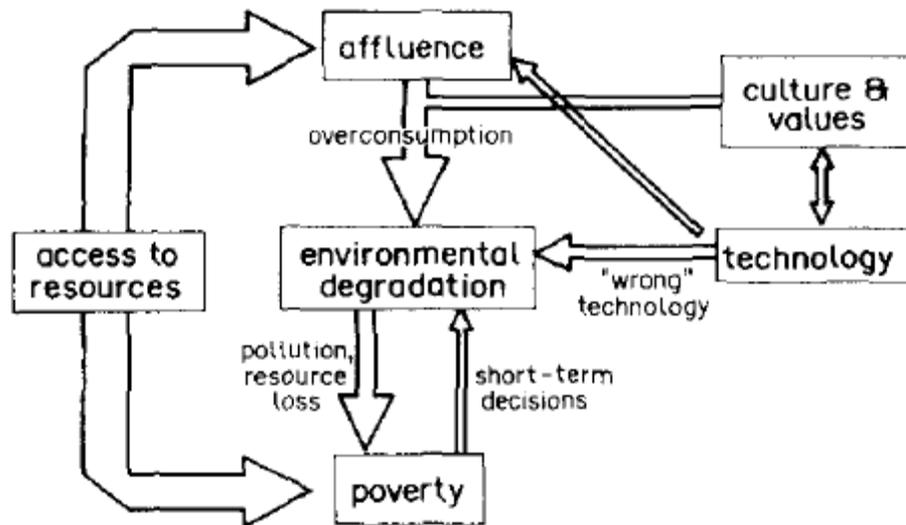
The objective of the chapter is to examine if green micro-credit can enhance household well-being and environmental sustainability. I discuss the outcomes from the three green enterprises and identify the barriers to expanding green micro-enterprises in the study area. My sample size for green micro-credit was small (6 households). Therefore, I have used both conventional and green micro-credit borrowing households for my data analysis. These are the conventional micro-credit borrowers who took green micro-credit when the options became available to them. I expect that green micro-credit borrowers will have similar impact as the conventional borrowers. Before disseminating my results, I will discuss the interrelation of poverty, environmental degradation and sustainability, and the framework (Millennium Ecosystem Assessment, used by CNRS) for greening of micro-credit.

## **5.2 Poverty, Environmental Degradation and Sustainability**

Environmental degradation and environmental sustainability have been recognized as critical global issues. In the development literature poverty is identified as a big obstacle in achieving environmental sustainability (WECD 1987). Lele (1991) recommends that development should be environmentally sound if it is to be permanent (Figure 5.1). There is now a growing consensus that many environmental problems in developing countries originate from the extreme conditions of poverty (Bartelmus 1986; Goodland 1995; Goodland and Ledec 1987; Portney 2003). So, development initiatives are emphasizing to reduce the rate of poverty by promoting economic growth for achieving environmental sustainability.

The Environmental Kuznets curve is a popular hypothesis describing the relationship between poverty and environmental degradation. The curve depicts an inverted-U relationship between pollution and economic development. Dasgupta et al. (2002) describes Kuznets's hypothesis as follows:

In the first stage of industrialization, pollution in the natural environment can rise sharply because people are more interested in jobs and income than clean air and water. Communities are too poor to pay for abatement, and environmental regulations are correspondingly weak. The balance shifts as income rises. Leading industrial sectors become cleaner, people value the environment more highly, and regulatory institutions become more effective. Along the curve, pollution levels off in the middle-income range and then falls toward pre-industrial levels in wealthy societies.



**Figure 5.1: Interrelation of Poverty and Environmental Degradation (Adopted from Lele 1991)**

Kuznets considers four factors to determine environmental impact per unit of economic activity (Kuznets 1955; Stern et al. 1996). These are: (1) Structure-the goods and services produced in the economy, (2) Efficiency-inputs used per unit of output in the economy, (3) Substitution-the ability to substitute away from resources that are becoming scarce and (4) Clean technologies and management practices-the ability to reduce environmental damage per unit of input or output.

Some potential negative impacts of micro-credit in developing countries are identified: degradation of habitats, pollution, loss of biodiversity, soil erosion, siltation of wetlands, textile dying pollution, water pollution due to fertilizer and pesticides, clearing of forest areas, etc (Kent 1991; Anderson et al. 2002; UNCDF 2006). Peredo and Chrisma (2006) find that in doing aquaculture people inappropriately use and dispose of hazardous chemicals on public lands and waters. The negative impacts depend on the absorptive capacity of the environment, and the infrastructure and services to deal with it (Dasgupta & Goran-Maler 1994). It is worth mentioning that millions of such micro schemes can collectively make bigger impacts on environment. That is why green micro-credit is needed. Green micro-credit can have positive impacts in achieving human well-being and improving ecosystem services. This can be done three ways: through green economic activities, using renewable natural resources, and in keeping the environment clean and conducive to creating livelihood options (Haque 2006).

### **5.3 Framework of Greening of Micro-credit**

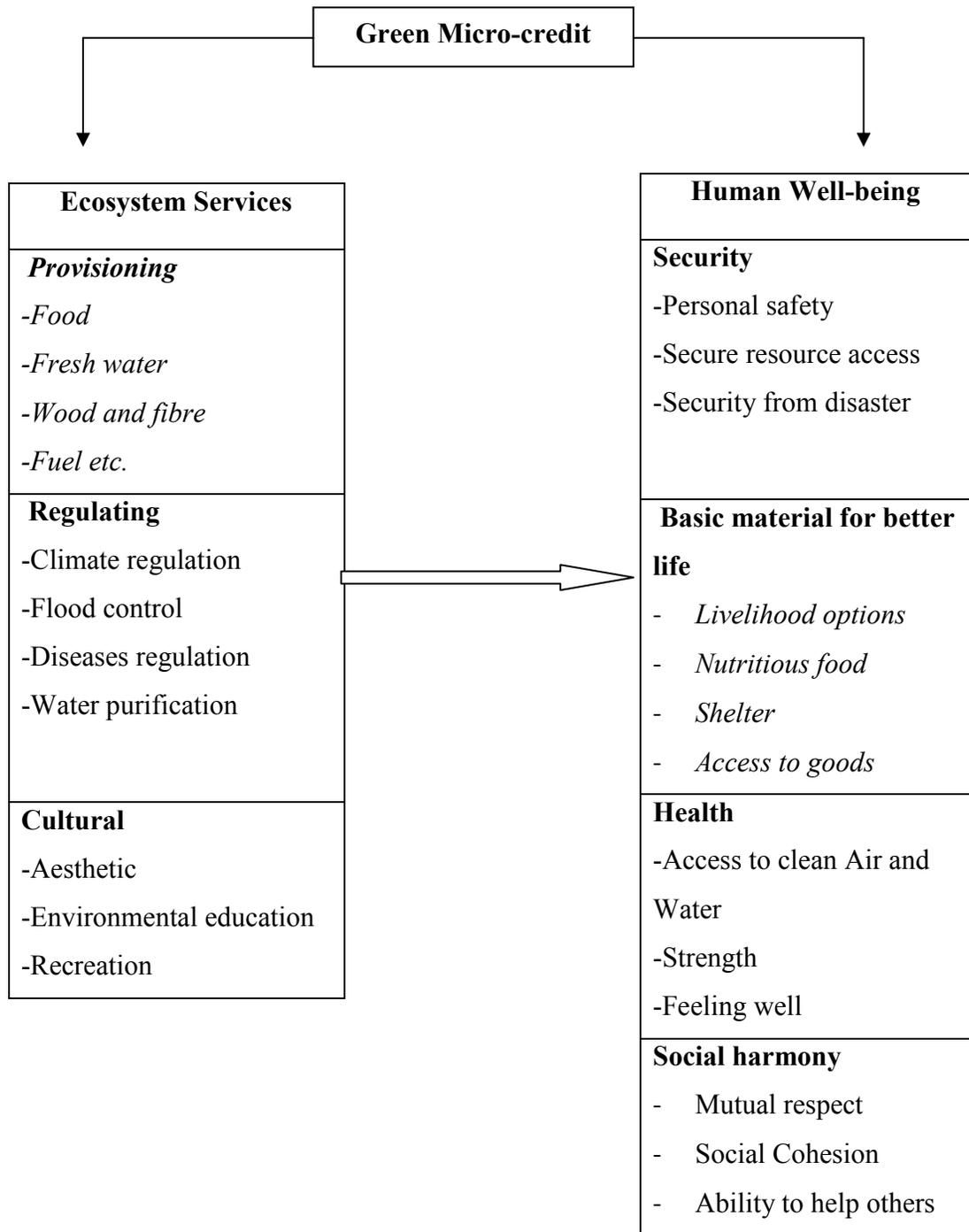
The concept of green enterprise development was based on Millennium Ecosystem Assessment framework (Figure 5.2). Green micro-credit scheme targets to improve

wetland ecosystem productivity and services (food, water, fuel, etc.) that can ensure human well-being and environmental sustainability. The term human well-being means improvement of individual income and health; ensuring basic needs is met and maintains environmental sustainability (CNRS 2007).

Based on the Millennium Assessment Framework (Figure 5.2), green micro-credit programs directly concentrate on how provisioning of ecosystem services such as food, fresh water, fibre, fuel can significantly contribute to ensure the basic material for better life (diversification of livelihood options, nutritious food, shelter, and access to all necessary goods). Green micro-credit is also focuses on human security (personal safety, secure resource access, security from disaster), health (i.e., access to clean air and water), and social harmony (mutual respect, social cohesion) by improving ecosystem services.

Ecosystem goods and services of *haor* are listed in Table 1.2. In 1999, *haor* was declared an “Ecological Critical Area” for its rapid degradation of ecosystem services. Swamp forest and grasslands nearby *haor* are being converted into agricultural lands. Some swamp forest plants such as *Hijal* (*Barringtonia acutangula*), *Karoch* (*Pongamia pinnata*), *Barun* (*Crataeva nurvela*), and *Baladumur* (*Ficus heterophylla*) are economically very important because some of them are used as fuel wood and some of them have medicinal value. Restrain and wise use of *hoar* resources can ensure the basic material for community people to live a better life (earning sources, nutritious food, shelter, access to goods) continuous to exist.

In chapter 4, my study showed that mat and handicraft making is one of the priority options for women to invest green micro-credit in. Creating more livelihood options, other than agriculture and fisheries, could possibly reduce the pressure on *hoar* resources.



**Figure 5.2: Linkages between Ecosystem Services and Human Well-being (based on Millennium Ecosystem Assessment 2005)**

Increased income can promote resource stewardship through establishing and strengthening property rights and access to more environmentally friendly technology (Peredo and Chrisman 2006). Green enterprises aim to re-grow swamp forest and *murta* plants alongside the *haor* basin. Flooded forest and *beels* protect the villages from floods, prevent soil erosion, and serve as a shelter for fish species.

Forest also sequesters carbon and sustains ecological health by providing clean air and water. Practicing organic agricultural methods will retain soil fertility. The use of green manure instead of chemical fertilizer will recover the natural fertility of soil. Many micro-credit borrowers in the study village prefer to do cow fattening because fat cows get sold very quickly with maximum profit. In doing so, hormonal medicines are injected for quick growth of cows. As a result hormones accumulate in flesh and beef becomes very unhealthy for human health. Green micro-credit encourages raising a local variety of cows. Local varieties are resilient to natural disaster and used for tracking crop fields. The upbringing processes of local varieties of cows are also environment friendly.

Micro-credit has the potential to maintain social harmony among community people. Mutual trust and understanding is crucial to achieving success in local entrepreneurship development (Pretty and Smith 2004; Dowla 2006). Ostrom (1990) asserts, “when participants may simply have no capacity to communicate with one another, no way to develop trust, and no sense that they must share a common future”, then finding avenues such as micro-credit that strengthen a community’s social capital may aid in solving the complexity of the commons. The system of group borrowing through mutual guarantee is based on recognition of strong cooperative behaviour and mutually reinforcing positive incentives (Van Bastelaer 1999; Dowla 2006). Group-based

micro-finance can lower the costs of monitoring common pool resources and also the costs of crafting new rules thus investing in social capital (Ostrom 1990; Ostrom 1994).

Schrieder and Sharma (1999) assert that:

Micro-finance has the potential to enable collective action, the coming together of the community, and more sustainable community-based organization. Insofar as micro-finance interventions allow investing in education and training, members of the community can acquire skills that will allow them to locally design, develop and manage community projects.

Some MFOs do mention educational efforts such as “to educate women not to harm natural resources by using wood to cook their food, instead show them how to use solar ovens and stoves” (Anderson et al. 2002). In Thailand, for example, Population and Development International (PDI) is trying to discourage deforestation by using micro-credit to promote resource-sustainable livelihoods, such as more soil-friendly and organic crops, harvesting non-timber forests products, and aquaculture. In an effort to preserve Cao Hai Lake in China, which is a home to migratory birds, conservation officials are using micro-credit to finance livelihoods that reduce pressures to drain the lake (Wang 2000). In Bangladesh, the research organization UBINIG is helping farmers to reduce their dependence on pesticides, begin composting for fertilizer, and practice mixed cropping aided by the seed bank.

#### **5.4 Outcomes from the Green Enterprises in the Study Area**

Groups of green borrowers are comprised of both males and females. Some of the loans are group-operated and some of them are individual loans. In 2010, three projects (Table 5.1) were implemented in the study area. These are: 1) organic vegetable cultivation and animal husbandry; 2) *murta* mat and handicraft; and 3) dairy food products. Organic

vegetable cultivation and animal husbandry was a group-operated enterprise when it was first initiated in January 2010. The five-member saving group decided to grow organic vegetables and rear local variety cows.

**Table 5.1: Green Micro-credit Enterprises in 2010**

Green enterprises	Total investment	Loan received	Technical assistance	Self investment	Monthly instalment
Organic vegetable and animal husbandry (Group-operated)	338,900	100,000	53,000	185,900	11,200
<i>Murta</i> mat and handicraft (Individual)	28,500	10,000	18,500	0	1120
Dairy food products (Individual)	That enterprise was started by a borrower. He used a small part of the loan from the organic agriculture and animal husbandry enterprise and gathered milk from that enterprise as well.				

**Source: Field data, Hakaluki Haor, 2010. All values in taka.**

After nine months of its operation, in October 2010, the enterprise was divided into two enterprises: 1) organic vegetable cultivation and dairy food products and 2) animal husbandry. Vegetable cultivation and dairy food products becomes an individually operated home-based enterprise. Animal husbandry is a group-operated enterprise and has four beneficiaries; one female and three male members. The amount of loan, the process of loan implementation, and the nature of technical assistance varies depending on whether the enterprises are group operated or individually operated.

#### **5.4.1 Organic vegetable cultivation and animal husbandry enterprise**

Organic cultivation means there will be no use of chemical pesticides, or fertilizers for producing crops, and the lands beside the organic fields ought to follow organic ways of cultivation (CNRS 2006). Five borrowers (4 males and one female) together took a loan for cow rearing and cultivating organic vegetables for three years in January 2010. In total, 45 decimal lands were used for organic vegetable cultivation. Cow rearing was incorporated with organic vegetable farming in an attempt to make sure there was a sufficient supply of organic fertilizers. Figure 5.3 shows the animal husbandry rearing enterprise of the five-member group.



**Figure 5.3: Cow Rearing by Five-member Savings Group**

This enterprise chose an isolated piece of 45 decimal lands. One of the male group members voluntarily gave 45 decimal lands. Five members were given training in organic ways of controlling pests, and in different ways of composting and storing animal wastes in order to safeguard air and water. The organic vegetable cultivation and animal

husbandry enterprise purchased three local varieties of cows. Unfortunately, one cow died due to food shortage and lack of proper shelter during the 7 months of prolonged flooding in 2010. The reasons behind choosing local varieties of cows were: 1) Cow dung would be used as green manure to grow vegetables. 2) Local varieties are resilient to flood and suited to the available fodder in the environment.

**Box 1: Organic Vegetable Cultivation and Animal Husbandry Enterprise, 2010**

**Project site:** Nonua village, Barolekha, CBO: Nanua- Pabijuri Mohila Samity

**Total amount of loan:** 100,000 taka.

**Technical grant:** 53,000 taka worth of agricultural equipment (shallow tube-well, and tractor). The grant also included a medical kit box and a mosquito net for cow rearing.

**Uses of principal loans:** For vegetable cultivation: land preparation, tilling, irrigation pump, purchasing seed, fencing, purchasing cow-dung during flooding. For cow rearing: purchase of three local variety cows, construction of cow sheds, fodder, medication.

**Expected positive environmental impacts:** prevent soil erosion, build good soil structure and fertility, protect ground water level, promote crop biodiversity by growing a variety of crops, and reduce green-house gases.

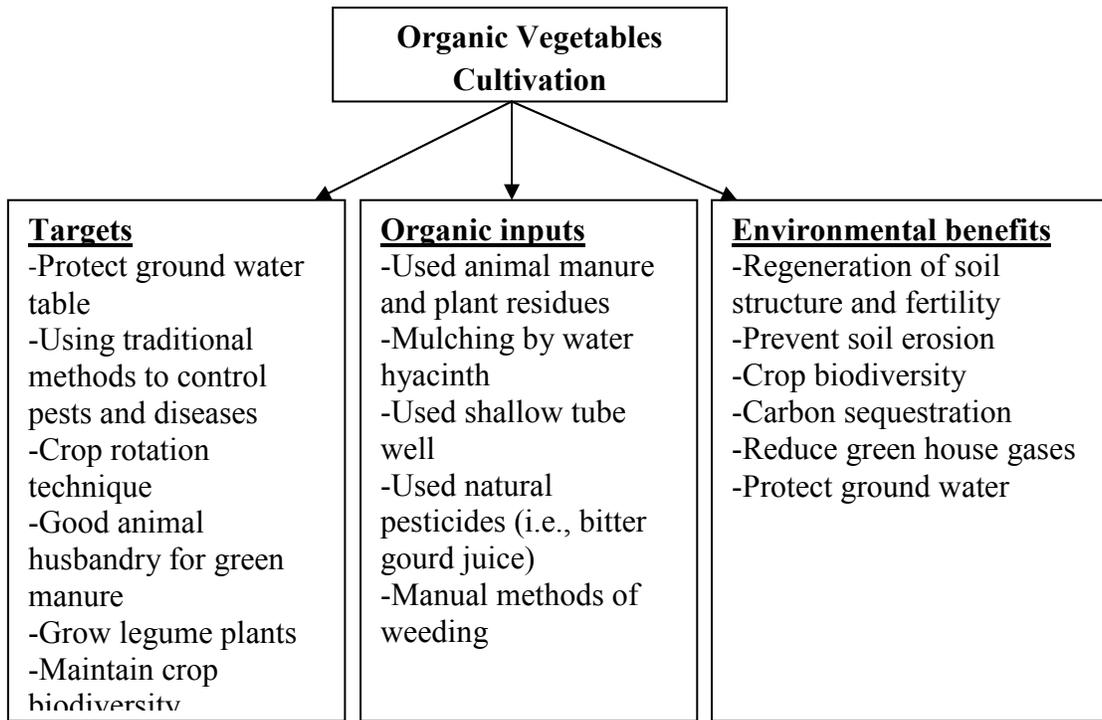
**Vegetables produced:** potatoes, tomatoes, cucumbers, french beans, water melons, egg plants, honeydew melons.

**Source:** Field data, Hakaluki *Haor*, 2010

The vegetable cultivation and animal husbandry enterprise took (Box 1) 100,000 taka as a green micro-credit loan, and received an additional “technical grant” (which really is a one-time donation and not a loan) that included a water pump, shallow tube-well and cultivation tools all of which were worth of 53,000 taka.

**How were organic agriculture practices done in the study area?**

Borrowers set some targets to ensure agricultural practices were organic. These included careful use of ground water; using traditional techniques to control pests, diseases and weeds; crop rotation techniques; and good animal husbandry to ensure year round supply of green manure. A list of organic inputs and expected positive environmental impacts is presented in figure 5.4.



**Figure 5.4: Targets, Organic Inputs and Expected Environmental Benefits from Organic Agriculture Enterprise**

For doing organic cultivation, the following methods were followed:

- Farmers used cow dung as a natural fertilizer. Cow dung was collected from the animal husbandry enterprise.
- Agricultural land was irrigated by shallow tube well from nearby ditches and ponds. Deep tube wells can easily draw water from deep underground.
- Mulching on top-soil by water hyacinth (*Eichhornia crassipes*) (locally called *jarmony*) to keep the soil surface wet enough for cultivation.
- Legume crops (i.e., French bean) were grown to maximize the soil nutrient level. Legumes can capture nitrogen from the air and use it for their own growth as well as for the benefit of other plants around them.
- For controlling pests and diseases farmers used some traditional and local methods. For example, to control pests, bitter melon (*Momordica charantia*) juice was put on plants. I found these indigenous methods very useful in getting rid of insects during the flowering stage of vegetable plants. Liquid green manure and ashes (residues from cooking stoves) were sprayed over the disease-affected plants at their flowering stage.
- Hand pulling of weeds was strictly followed for controlling weeds.

## Cash flow status from vegetable cultivation and animal husbandry enterprise

**Table 5.2: Cash Flow Status of Vegetable Cultivation and Dairy Food Enterprise, 2010.**

Item	Target (kg)	Achievement (kg)	Sale (kg)	Own consumption (kg)	Value/kg (taka)	Total income (taka)	Production cost	Surplus
<b>Cash flow status from vegetable cultivation</b>								
Potato	500	320	270	50	15	4050	3300	750
Tomato	110	70	50	20	15	750	300	450
Cucumber	150	120	100	20	10	1000	300	700
French bean	50	40	30	10	30	900	400	500
Honey dew	300 pieces	0	0	0	0	300	500	200
Water melon	200 pieces	0	0	0	0	0	300	0
<b>Dairy Food Products</b>								
Milk	800	750	650	100	30	19,500	15,000	4500
Sweet yogurt	80	80	60	20	90	5400	610	4790

**Source: Field data, Hakaluki Haor, 2010**

After the successful start-up of the vegetable cultivation and animal husbandry enterprise, the whole area remained flooded for seven months. The group was able to harvest 7000

taka worth of vegetables (Table 5.2) as opposed to their production cost of 5100 taka. Some of the vegetables and local fruits such as water-melon and, honey dew melon were damaged by flood water. Production cost of these items includes field preparation, seed purchase and labour cost. Due to early monsoon flood in 2010, the vegetable cultivation and animal husbandry group could not get the full harvest as some the vegetables were in the premature stage. The group plans to expand the subproject by leasing more cultivable area for vegetables. It also produces value-added milk products like ghee, butter, and other local sweet items from their cow-milk. Community people are showing their interest in organic farming and the borrowers think organic vegetable cultivation and animal husbandry will potentially grow in the near future. In September 2010, after seven months of operation, the group successfully completed repaying the loan instalment with a 15% interest rate. Group members faced difficulty in repaying the amount of instalment during the 7-month flood period. Over the flood period, CNRS only took their principal loan amount rather than taking the 15% interest as well.

#### **5.4.2 *Murta* mat making and handicraft enterprise**

*Murta* mat (locally called *Shital patti*) making and handicraft enterprise was developed by Dipti Rani Das from Nonua *Mahila Samity*. *Murta* is an indigenous cane widely used to make floor mats in Northern Bangladesh. It was an individual home-based enterprise. *Shital patti* was once a precious handicraft due to good demand in medium-to high-end markets. This fine bed mat is gradually disappearing due to the scarcity of raw materials (*murta*) and the resulting lack of production by the traditional producers.

*Murta* grows in marshy land around wetland areas (Figure 5.5). Generally *murta* saplings are planted in September-October, and take about a year to be suitable for use for mats. The plant starts flowering in the month of April and increase its height from October to March.



**Figure 5.5 (From up-left): *Murta* plant, *Murta* Cane, A Borrower is Making Mat, Dried *Murta* Cane**

The borrower and her husband (Figure 5.5) used to make *murta* mats for a long time as the family dependent mostly on selling mats to make their living. The borrower leased *murta* fields in the entire village on a one-year contract basis. The cost of *murta* mats varies according to season (i.e., wet and dry season). For example, during the flood season one piece of *shital pati* measuring 20 sq. ft. (5feet by 4 feet) in size requires about 400 pieces of *murta* plants, costing about 800 taka ( 100 pieces of *murta* plant cost 200 taka). In the dry season, the same amount of *murta* plant costs 250 to 300 taka (100 pieces of *murta* cost 50 to 60 taka).

**Box 2: *Murta* Mat and Handicraft Enterprise, 2010**

**Project name:** *Murta* mat and handicrafts; **Project site:** Nonua, Barolekha

**Amount of principal loan:** 10,000 taka

**Technical grant:** 18,500 taka worth of mat making equipment such as chopper, knife, bench, bucket, mug and brush, sign board, and a three-wheeler transportation van.

**Uses of principal loan:** Raw materials, dye purchase, transportation,

**Environmental benefits:** *Murta* plants work as a protection against floods by significantly reducing soil erosion from storm water.

**Source:** Field data, Hakaluki *Haor*, 2010

The total investment in *murta* enterprise was 28,500 taka. The borrower took a 10,000 taka loan from CNRS. The project received an additional 18,500 taka as a technical grant. The technical grant included (Box 2) a chopper, knife, bench, bucket, mug and brush,

sign board, and a three-wheeler transportation van. Table 5.4 shows that cash flow status from *murta* mat and handicraft enterprise in 2010. The mat making enterprise first targeted to produce 10 mats in a month but fell short of the target for several reasons.

**Table 5.4: Cash flow Status of *Murta* Mat and Handicraft Enterprise, 2010.** From July to October, there was no mat making activity due to flood.

Months	Target (number of mats)	Achieved (number of mats)	Cost (taka)	Sale price (taka)	Surplus (taka)
January	10	0	0	0	0
February	10	7	3000	5100	2100
March	10	6	3500	5950	2450
April	10	8	3000	5100	2100
May	10	5	3000	5100	2100
June	10	5	3000	5100	2100

**Source: Field data, Hakaluki Haor, 2010**

From January to June, out of the targeted 60 mats, Dipti was able to produce only 31 mats because of floods, her heavy domestic workload and high prices of *murta* plants. The early monsoon flood in 2010 inundated the entire village for nearly 7 months. Out of her sales from those 31 paties, she earned 26,350 taka as opposed to her expenses of 15,500 taka, gaining a gross profit of 10,850 taka. During household interview and focus group discussions, it was found that Dipti was very optimistic about the project. She was also interested in extending the business by employing other women in the processing, as the *pattis* are in good demand during summer season.

## 5.4 Barriers To the Sustainability of Green Enterprises

Sustainability is a process which can be achieved by conserving and retaining the natural conditions of the environment. Proper ecological knowledge, collaborative efforts and adaptation techniques are crucial to bring sustainability to the micro-credit enterprises. For example, the farmers are now growing early harvested crops that can be marketed before March (early monsoon period). In addition to flooding, another threat to green enterprises is the proximity of non-organic vegetables fields to organic fields—run-off from pesticides and chemical fertilizer can contaminate the organic fields. The following sections discuss the barriers or challenges that the green borrowers have faced in implementing organic cultivation, mat making and dairy food products (Figure 5.6).

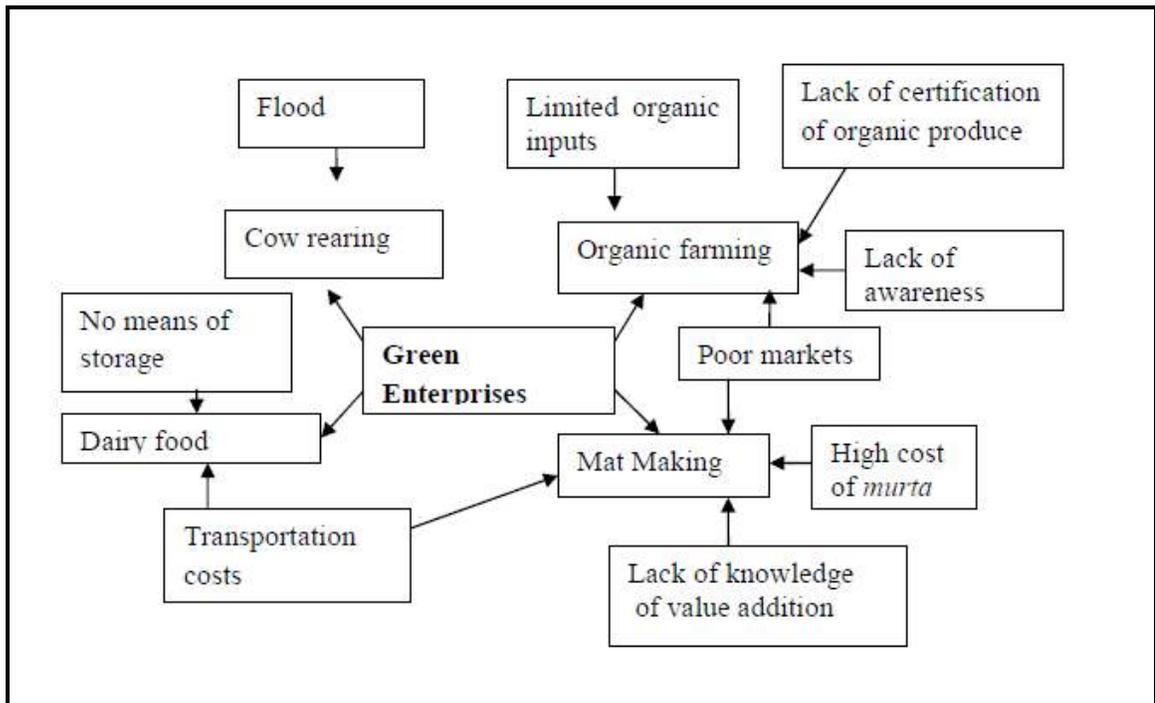


Figure 5.6: Key Problems Associated with the Expansion of Green Enterprises in

Hakaluki Haor

### **Natural calamity/disaster**

The biggest and most unavoidable challenge for the stakeholders of green micro-credit enterprises is prolonged flooding which occurs every year. All of the stakeholders were affected by early flood in 2010. During the seven-month period, organic vegetable farming, production of compost fertilizer, growing of seedlings in the nursery, and harvesting of crops became impossible. Green manure that was made from cow dung washed away with flood water as the stakeholders did not have any means to preserve the compost during the flood season. The rate of producing mats (traditional bed mat) fell short due to scarcity of *murta*. *Murta* could be collected from nearby villages but the cost was two times higher than normal. In most cases, the houses of CBO members were submerged, which kept them from doing any business. Cattle and poultry rearing were also affected due to shortage of local food. Sometimes borrowers had to make special arrangements to keep their farm animals alive. For example, the five-member CBO made a floating base from banana trees to keep the cows safe and alive.

### **Lack of green manure in the area**

In Nonua-Pabijuri, cow dung is extensively used as green fertilizer. The Hindu communities in the village see cow dung as a holy object for their religious purpose and use it for strengthening their house walls. Moreover, the inhabitants use mud-made stoves for cooking and cow dung is used for fuel (Figure 5.7).

Participants said that if they bought fuel wood from the local markets, it would cost them 30 to 50 taka per day depending on seasonality. I found that many borrowers do not have knowledge of how to compost manure. Only four males and 10 females have had any training in organic farming and composting.



**Figure 5.7: Uses of Cow-dung Fuel for Cooking**

#### **Location of organic and non-organic vegetable fields**

Lack of environmental monitoring is a barrier to the green micro-credit scheme. Most of the literature on organic agriculture argues that in any ecological area, if the entire place is not converted into organic agriculture, it is impossible to cultivate only some pieces of land in organic ways. In most cases, organic and non-organic vegetable fields are located so closely that pesticides and chemical fertilizer can be transferred to the organically fertilized fields.

## **Marketing of the products**

The sustainability of the project depends on the profitability of the green products.



**Figure 5.8: French Beans have a High Market Value in Big Markets**

Currently, lack of marketing of green produce appears to be the greatest challenge to green enterprises. In fact, organic products, handicrafts, and mats have significant commercial value in the big markets but low prices in the local markets. For example, the selling price of French beans (Figure 5.8) is 80 to 100 taka in the big markets where-as the selling price is only 30 to 40 taka in the local markets of Nonua-Pabijuri.

The current projects are giving support to buy a three-wheeler van for marketing and carrying the products. However, the real challenge lies in the local market situation. If the enterprises fail to sell their products, it will directly affect the project outcome. In the future, if marketing the product to big cities is possible, then the project's sustainability

and achievements will be greater. Poor people who always have to think about their meals seek a quick return from their businesses. Investment in natural resources requires a long-time investment with a delay in returns. Sometimes, the market depends on the awareness of the consumer. For example, if the consumer knows that organic vegetables are safer and better for their health, then there will be a stable market for organic vegetables.

### **Lack of knowledge and proper training**

The project beneficiaries lack proper environmental knowledge and technical training for proper implementation and sustainability of the project. About 100 percent of women in the study village are engaged in at least one or two in-house farm activities—for example, land and seed bed preparation, sowing-planting-transplanting, harvesting and threshing, winnowing-parboiling-drying, storage, drying and preservation of straws, and homestead cultivation—but none of them really know about the proper methods of composting fertilizers. Moreover, knowledge about the treatment of cattle and controlling seasonal attacks by pests are crucial for the sustainability of the projects.

### **5.6 Conclusion**

This chapter discussed the potentialities of green micro-credit to enhance household well-being in the study area. In Chapter 6, I will give a summary of my research and discuss the major research findings as they relate to the specific objectives.

## Chapter Six

### Summary, Conclusions and Policy Implications

When I first visited the village Nonua-Pabijuri, I had doubts about the effectiveness of micro-credit. My impression changed after a few days when I interviewed people. Conventional micro-credit and green micro-credit seemed very valuable to people according to the comments from many. Throughout my fieldwork, I asked one question to every participant, “micro-credit has 15% interest rate, so why do you still prefer micro-credit or green micro-credit?” Many of the people brought up the following points:

Despite its high interest rate and [requirements for] instant repayment, this is the only source of money when we need to get back on our feet. We need money to start up a business but banks do not make loans to us. With micro-credit, we can talk to and ask for suggestions from NGO staff if any difficulty comes up. People’s perception about livelihood activities has changed in the past 10 years. Besides credit, CNRS has given us training and information sessions for the best use of micro-credit. We never had that opportunity before.

The research was conducted in the village of Hakaluki *haor* for a four-month period from September to December 2010. I used a participatory approach to reach my research objectives as local people’s involvement in every stage of the data collection process was required to reach to my research objectives. I used a qualitative case study approach (Nelson 1991) with the collection of qualitative and quantitative data. Secondary data was collected from *upazila* office, CWBMP, CBFM-2 project and CNRS records and reports. Field support and other logistical assistance were provided by CNRS. The research outcomes gather the perspectives and views of the borrowers about the potentiality of green micro-credit, the current green projects and how the projects are

being operated, borrower's preferences in pursuing green micro-credit, barriers in implementing green micro-credit and the sustainability of green micro-credit.

This chapter discusses the key findings that emerged from the research and draws conclusions by pointing out some policy implications for further improvement of green micro-credit operations. Findings of the research offer an assessment of the role of conventional and green micro-credit on people's livelihoods; overall women's empowerment; and insights into the barriers for implementing green micro-credit. It is important to mention here that green micro-credit in the study area is the first of its kind in Bangladesh. However, the results of this research are applicable to the cases examined. A longitudinal (time depth) research on green micro-credit would produce results that would be more generalizable. The following key findings pertain to the three objectives of the research, with two key findings for objective 1 and 3 and three key findings for objective 2.

## **6.1 Key Findings**

***Key finding 1: Those households who have diversified their livelihood options tend to have more financial security and assets. Both conventional and green micro-credit is important in creating livelihood options.***

Access to financial services, through conventional and green micro-credit programs, helped the borrowing families increment their monthly incomes and build up assets and thus provides protection against crises. Except for agriculture and fisheries, community people did not have any permanent income source to secure their livelihoods before they were involved in micro-credit and green micro-credit operations. Now people are

expanding their livelihood options through micro-credit and green micro-credit support (Table 3.4).

My study revealed that the more livelihood options households have, the less vulnerable they are to crises. Having a diversity of livelihood options improves the ability to manage risk more smoothly over the seasonal cycle, consistent with Azam and Imai (2009). My research revealed that 18 households (58%) have more than one income-earning option and these households are very regular in repaying loans and have sustainable income per month. The rest of the households (42%) have one income-generating option and use loans for household consumptions (Figure 3.7). Some of these 58% households have solar-powered electricity, life insurance, own small wooden boats, bi-cycles, and taxi. Female-headed households (13%) earn the lowest income of all families in the community. Due to the influence of micro-credit and green micro-credit, many households in the community who used to depend on agriculture and fishery resources, and *haor* resources for living can now invest their money in alternative income-generating activities.

***Key findings 2: Green micro-credit enterprises are innovative, well organized, and the borrowers are willing to share benefits. Green enterprises have the potential to create livelihood options.***

In many developing countries, the lack of efficient use of natural resources for maximizing economic benefits at the community level has been identified as a reason for increased poverty especially in the rural areas (Craig and Potter 2006). Studies on *haor* resources show that unequal access and unsustainable use of *haor* resources are the causes of poverty in the area. CNRS first commenced its green micro-credit initiatives at

*Nonua-Pabijuri* in January 2010, aiming at sustainable use of resources by providing the impoverished people with green micro-finance. Green micro-credit builds on the existing conventional micro-credit interventions. Community people are very interested in taking green micro-credit loans. Table 3.4 represents some potential uses of green micro-credit; as suggested by CNRS's clients. Many of the conventional borrowers show interest in the green micro-credit program and enhanced livelihood options.

I found the 3 green enterprises to be well organized, innovative and benefit-sharing. My study on green enterprises (Figure 3.13) indicates that the borrowers are capable of surviving in times of crisis. When *boro* harvesting failed in 2010, these 3 enterprises survived through sharing their foods, resources and ideas. Green borrowers have the capacity to effectively operate their green enterprises in a sustainable manner.

***Key findings 3: There are clear differences between men's and women's preferences in the use of green micro-credit. Women mostly prefer home-based activities, as appropriate socio-culturally.***

Table 6.1 shows men's and women's preferences in the use of green micro-credit. Majority of the women's preferences primarily focus on their family well-being. Men's preferences are profit-oriented. Women mostly prefer home-based activities. Such activities will allow them to perform their household (or in feminist studies terminology, reproductive) roles. Besides reproductive roles, women consider two factors for choosing home-based economic activities. These factors are 1) women's restricted mobility and 2) lack of direct access to market. Male's preferences are shifting to boat buying and cow fattening, from which households can get quick return of their money. The reason for

preferring small non-mechanized boats is that borrowers can move their families and domestic animals to a safer place during floods.

**Table 6.1: Men’s and Women’s Priorities in the use of Green Micro-credit**

<b>Women’s priorities</b>	<b>Percentage</b>	<b>Men’s priorities</b>	<b>Percentages</b>
1.Livestock rearing	90	1.Rice cultivation	79
2. <i>Murta</i> mat making	84	2. Non-mechanized boat	75
3. Vegetable cultivation	68	3. Cow fattening	75
4. Dairy and other food products	60	4. Vegetable cultivation	62
5. Handicraft and sewing	25	5. <i>Murta</i> mat making	42
6. Fish netting	16	6. Aquaculture	41
7. Fish drying	11	7. Growing seedlings	21
8. Making paper bags	8	8. Fish drying	15
		9. Fish netting	15
		10. Dairy and other food products	8

**Source: Field data, Hakaluki Haor, 2010**

***Key findings 4: Results related to women’s empowerment are diverse and complex.***

***Women’s empowerment needs to be assessed using local socio-cultural construct.***

***Women’s empowerment can mean different things for different individuals.***

Analysis of the four indicators of women’s empowerment, reveals that women are empowered in some dimensions; and some dimensions need to be improved. For

example, Jharna Chakroborty is a successful entrepreneur and works with other four male members in animal husbandry enterprise but she is not allowed to move alone outside of the village. The organic agriculture and animal husbandry project was started with 4 males and one female member. In 2003, Nonua *Mahila Samiti* was only formed because women were not accepted by male members to join in the CBOs. This example is a success of the green micro-credit scheme. In some cases, even where women are directly involved in market-based economic activities (i.e., mat making, cow rearing); they often have to depend on their husbands or other male family members for marketing their dairy products, meats and mats.

Table 4.3 shows that women are able to move freely and attend NGO meetings and training within the village. Thirty-two percent of the women can go outside the village without being accompanied by males. Just 10 years ago, rural Bangladeshi women had few or no opportunities to leave their home or had restricted movement within the community (UNDP 2008). These 32% of women's free mobility is an indicator of their social improvement. All of the women have cash savings with CNRS but women still cannot take part in major household decision-making such as land purchasing and signing legal documents. Women report that their voices carry greater weight since they have been involved in micro-credit schemes. All of the women are highly involved in decision-making related to purchasing food stuff and stationeries and in the education of children.

It is arguable that women's bargaining power would have improved if they were able to engage in livelihood activities without having to lean upon their husbands (Kabeer 1997). Montgomery et al., (1996) claim that male's dominance in decision-making is disguised

as “family partnerships” of credit control. For the particular context of my study, it can be said that jointly-controlled credit does not always affect women’s empowerment. The argument is based on the fact that in most cases husbands help in marketing the products, as otherwise women would need to hire an intermediary to bring their products to the markets. In that case they would get lower profit return and would be unable to repay their loans. Due to the lower literacy rate of women compared to men, a good number of women need their husband’s help in bookkeeping. In the mat making project, the borrower makes mats and her husband sells the products, and bookkeeping is done by both. My finding concludes that it is hard to determine the actual level of women’s empowerment in the study area but their social position is advancing day by day.

***Key findings 5: Restricted local movement, household chore workload, gender-based labour distribution, and lack of knowledge and training act as barriers for women in investing green micro-credit.***

Women’s entrepreneurship potentialities are hindered by the following factors:

- Women do not have direct market access even to sell their green products. Female-headed households face difficulty in marketing their products.
- Women have 11-12 hours of workload per day in the wet season and 14-15 hours of workload in the dry or winter season.
- Interestingly, most of the women are engaged in post-harvest agricultural activities but they do not have any land ownership in the study area. Only widows have land in their own name.

- Women's groups are facing severe obstacles due to low literacy rates, lack of proper environmental knowledge and training, and narrow skill-sets. These factors hinder the effective use of natural resources.

***Key findings 6: Green enterprises are potentially important for the well-being of the borrower's household and for environmental sustainability. Borrowers have the capacity to maximize economic benefits from green enterprises.***

Results from the four micro-credit projects indicate that green micro-credit can be potentially important to improve the livelihoods of the community people (Table 6.2). Borrowers were able to make profit until the floods in April 2010. Organic vegetable cultivation and animal husbandry was a group-based project when it first started in January 2010. After nine months, in October 2010, the project was divided into two projects: 1) organic vegetable cultivation and dairy food products and 2) animal husbandry. Vegetable cultivation and dairy food products became an individual enterprise and had been taken care of by two members who are husband and wife. Making dairy food was exclusively the couple's idea. The husband bought milk from the animal husbandry project and the wife made curds (yogurt). The idea emerged when they started thinking about how they could make more money and save some for crisis periods. This successful enterprise proves that jointly-controlled green micro-credit can also ensure household well-being. The women's group also suggested that the price value for *murta* mats could be increased if they were embroidered.

**Table 6.2: Cash-flow Status from Green Enterprises, 2010**

<b>Green enterprises</b>	<b>Production cost (in taka)</b>	<b>Sale revenue (in taka)</b>	<b>Profit-cost (in taka)</b>
Organic vegetable	5100	7000	1900
Mat and handicraft	15,500	26,350	10,850
Animal husbandry	15,500	19,000	4500
Dairy food products	610	5400	4790

Source: Field data, 2010

***Key findings 7: Natural hazards and the lack of proper marketing of green products are the main barriers to the sustainability of green enterprises. NGOs and government organizations need to address these.***

Assistance and advocacy from government and NGOs are necessary for the sustainability of green enterprises. In 2010, due to unusual and prolonged floods, organic farming and animal husbandry were affected. Even post-flood, farmers did not have rice and vegetable seeds to restart agriculture. CNRS assists farmers by providing agricultural equipment but financial limitations narrow their extent of cooperation. Lack of green manure just after the flood inhibits the farmers from processing soil for agriculture. Preservation of green manure is crucially important to do organic farming effectively. Another big challenge is the marketing of green products. Organic vegetables and *murta* mats have high value in the big markets but bring less profit if they are sold in local markets. Horizontal and vertical linkages, with government or NGOs support, are needed to establish a niche market for the green products.

## 6.2 Policy Implications

Based on my field observations, considering the views of micro-credit borrowers, I have drawn some suggestions for further improvements of green enterprises.

- Despite all the positive evidence, the micro-credit system is still criticized for high interest rates on the principal amount. Micro-finance organizations have not found any alternative solution to subsidize the interest rate. (As of 2010, CNRS's interest rate was 15%; Grameen's was 20%). A lower interest rate would provide additional incentives in the green micro-credit schemes. Some crop insurance systems can also be taken into consideration.
- Community mobilization towards green income-generating activities and conservation practices will be possible when the community sees the benefits. From green borrowers' viewpoints, sustainability of the green projects depends on two factors: 1) environmental awareness among community people and 2) creating markets for organic products. It is an unavoidable fact that people will not be interested if they do not make profit from businesses.
- Borrower capacity building brings high returns per investment, and creates enterprise sustainability, so that the enterprises can keep their businesses after the expiration of the projects. Previous studies showed that most of the CBOs departed at the end of projects. Another big challenge against environmental sustainability is the location of organic and non-organic agricultural fields side by side. Run-off from non-organic fields will obviously contaminate the organic fields. Adequate environmental

knowledge and exercise of good environmental activities need to be developed among communities. Some important points in are:

- Many community people still do not know about composting.
- Women's knowledge about environmental issues is very limited.
- Training, information and knowledge are the important factors identified by participants. Training should be need-based with emphasis on the process of value addition and product diversification. For example, French beans can be marketed in different ways, such as raw, can-processed, and dried.
- Floating-bed or soilless cultivation can be an alternative livelihood option for a flood-prone area like Hakaluki *haor*. A floating platform is made of decomposing heaps of water hyacinth, with an upper surface layer of ash, coconut fibre, and soil. In remote and waterlogged villages in the southern part of Bangladesh, farmers have been successfully growing potatoes, cucumber, tomatoes, cabbage, egg-plants, and leafy vegetables for two centuries.
- Farmers need to have sound knowledge about the quickly harvested crops. The area is vulnerable due to early monsoon flooding. After lessons learned from the first phase project in 2010, in the second year of the green project, the borrowers started growing early harvested crops. Supply of seeds, compost, and agricultural equipment should be available at the beginning of the cropping season. Moreover, I found only 4 males and 10 females received training from CNRS. The number of target and trained population should be increased. Assistance from the GOs should increase in a way

that people develop interest in green activities. The CNRS and government organizations are very important for creating environmental and gender awareness among community members. Government initiatives and assistance are also necessary for improving the infrastructure in the community.

To conclude, micro-credit or green micro-credit is not a one-size-fit-in solution for reducing poverty. Success of micro-credit depends on how borrowers are investing their credit and many other socio-economic factors. For a remote area like Nonua-Pabijuri, people will not be able to create livelihood options until there are proper markets and infrastructure facilities.

I would like to restate that green projects only started in 2010. The long-term outcome and potentiality and sustainability of the projects are yet to be assessed. My research was a small step towards assessing the role of micro-credit and green micro-credit. Some of the issues in the current projects can be explored; this is for the sustainability of the project. One important concern regarding project outcome is what will happen after the project tenure is over. Many participants think that nobody will be interested in doing organic agriculture or cow rearing as soon as the projects end. On the other hand, one group of people thinks that if the current enterprises can earn benefits, people will be interested in investing money and conserving biodiversities as well. If the micro-credit recipients in Bangladesh adopt eco-friendly livelihood activities, they can make a big change towards environmental sustainability.

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## Appendix i

### Household Interview

September –December 2010 1.Name of the respondent:

1.1 Name of village/community/Para:

1.2 Household ID:

1.3 Religion:

#### 2. Micro-credit & Assistances

2.1 Do you borrow money from multiple sources at a time? (Relatives, money lenders, NGOs)

2.1 Which credit do you have access to?

General micro-credit

Green micro-credit

Both

2.3 What are the terms and conditions for getting micro-credit and green micro-credit from CNRS?

2.4 Please list the income-generating activities you invest general or green micro-credit?

2.5 List of green activities in the area.

2.6 Why do you prefer (or not) micro-credit compared to other sources of loan available in your locality?

2.7 Does the micro-credit organization provide any training on capacity building? If yes, what type?

2.8 Do you have any other comment about credit?

#### 3. Household composition

Members	Gender (M:1, F:2)	Relation with HH head	Age	Education	Primary occupation	Secondary occupation	Marital status
B	C	D	E	F	G	H	K

--	--	--	--	--	--	--	--

F: illiterate: 1, primary: 2, secondary: 3, higher secondary: 4, graduate: 5, post-graduate:6

K: Unmarried:1, married:2, divorced:3, separated:4, widow:5, single:6, abandoned:7

#### 4. Household related

4.1. Who is the owner of the house?

4.2 Area of land (acres/hectars):

4.3 Housing condition:

Building	Semi-building	Tin shed	Sun grass/Bamboo made	Mud-made	Others

4.4 Do you have latrine in your house? (Yes=1, No=2), If yes, types of latrine

(Code: Sanitary/slab:1, earthen:2, bush:3, open field:4, hung latrine:6; others:99

4.5 What is the source of drinking water in your house?

(Code: Tube well/supply/tape: 1, well/pond/river/channel: 2)

4.6 Where do you collect water for domestic uses?

(Code: Tube well/supply/tape: 1, well/pond/river/channel: 2)

5.5 Who owns Tube well?

self

Joint

Neighbour

NGO

Others

4.8 Do you have electricity? (1=yes, 2=No)

4.9 What do you use for cooking?

Dried cowdung:1; wood:2; husk:3; jute stick:4; electricity: 5; leaves/shrubs:6;

kerosene:7; charcoal:8; straw:9; gas (natural/methane):10; bamboo:11, others:99

#### 5. Asset and property related:

Sl. No	Asset code	No	Value	Asset/material code
A	Land (excluding homestead)	Area		Self=1; garden=2; leased=3; temporary lease=4; long-term lease=5; khas land possessed=6,
1				

2				N/A=7
3				
4				
<b>B</b>	Agricultural equipments			
1				plough=1; spade=2; harrow=3; power tiller; deep tube well=4; shallow well=5; husking engine=6, N/A=7; Others=99
2				
3				
4				
<b>C</b>	Livestock			Cow=1; buffalo=2; sheep=3; goat=4; duck=5; hen=6, pigeon=7; N/A=8
1				
2				
3				
<b>D</b>	Pond	Area		Ownership status: Self=1; own with family=2; joint ownership=3; leased=4; N/A=6; others=99
1				
2				
3				
4				

## 5. Livelihood related

### 5.1 Livelihoods by season

Respondents	Jan	Feb	Mar	April	May	June	July	August	Sep	Oct	Nov	Dec

5.2 Monthly income of the household: \_\_\_\_\_ taka

## 6. Women's empowerment related

### 6.1 Which decisions are you able to take independently?

Food stuff purchase	
Poultry and cattle purchase/sell	
Seeds sell/purchase	
Stationeries purchase for children's education	

Toiletries purchase	
Land purchase/sale	
Fishing equipment sale/purchase	
Legal document signing	

6.2 Please circle your freedom of movement (please mention along or accompanied)

Paternal house	
Relative house outside village	
Relative house inside village	
NGO offices	
Local market	
Nearest <i>Upazila</i> centre	
Cultural programs	
Political meeting	
Casting votes	
Children's school	
Government office	
Hospital	

6.3 What assets do you have?

Resource	Ownership
Land	
Pond	
Garden	
Homestead land	
Livestock	
Poultry	
Gold	
Sewing machine	

Fishing equipment	
Agricultural equipment	
Savings	
Fishing equipments	
Cycle/van	

Code: ownership pattern: Inherited:1; Purchased:2; Gift:3; Own earnings:4; Any other way:5

6.4 How a woman's social status can be improved?

### 7. Awareness and communication

7.1 Where did you learn about green micro-credit?

7.2 If you were to lose everything, how would you be able to get back onto your feet?

Self (saving in NGO)

Gift from relatives (local)

Grant from governments

Gift from relatives (overseas)

Loan from relatives (local)

Other (specify)

Loan from relatives (overseas)

### 8. Ecology and environment

8.1 What natural resources do you share for making a livelihood?

8.2 How important are each of the following goal to you? 1=being most important, 5=being least important

Statement	1	2	3	4
5				
Ensuring a stable future for my family				
Improving my living standard				
Resource sustainability				
Community-based resource management				
Increasing cooperation to manage resources				
Having more control over resource management				

8.4 What environmental degradation have you seen in your area?

## Appendix ii

### Questionnaire for Focus Group Discussions and Key Informant Interviews

**Objective 1:** To assess the role of micro-credit and green micro-credit in creating livelihood options

- What are the primary income-generating activities (individual and group-based) in the area?
- What are the secondary income-generating activities (individual and group-based) in the area?
- What are the factors that impacting your livelihood activities?
- Why do you need a micro-credit?
- What is green micro-credit to you?
- What are the characteristics of micro-credit and green micro-credit loans?
- Please tell me about the conventional and green micro-credit operations of CNRS.
- What natural resources do women and men have equal access to (ability to use)?
- Are the borrowers' able to repay loans on time? How do you repay loans during floods?
- List the most profitable income-earning activities in the area?
- Discuss issues related to fishery resources.
- How more livelihood options help you in sustaining your livelihood?
- How the three green-enterprises are operated?
- Why female-headed households are the poorest in the community?

**Objective 2:** To identify women's priorities in the use of green micro-credit, and to determine the factors that can constrain (or facilitate) women's participation in decision-making in obtaining and using green micro-credit.

- Why most of the women prefer home-based income-generating activities?
- What type of natural resources do you use for income generation (both men and women)?
- Who has the control to invest green micro-credit in income-generating activities?

- Are women socially excluded from particular livelihood strategies? If yes and why?
- Are there any cultural and social factors that are prohibited women to invest their loans in any income generating activity?
- What are the factors that encourage you to take green micro-credit?
- What practical needs (i.e. training or others) have women identified in using green micro-credit?
- How do the borrowers' do organic farming?
- Why women do not have any land property on their name?
- Have you seen any changes in women's socio-economic status in the area?

**Objective 3:** To examine if green micro-credit can enhance household well-being and environmental sustainability.

- Does micro-credit or green micro-credit help to increase your monthly income?
- What are the good and bad environmental practices in the area?
- What do you understand about environmental sustainability?
- What are the obstacles to achieve sustainability of natural resources in the area?
- Have you seen any environmental degradation in your area??
- Are there any ways you think women's social status could be improved?
- What is your suggestion to improve green micro-credit enterprises?
- How the marketing mechanisms for green products can be improved?

## Appendix iii



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### APPROVAL CERTIFICATE

July 26, 2010

**TO:** Lubna Yeasmin (E.Haque)  
Principal Investigator

**FROM:** Brian Barth, Chair  
Joint-Faculty Research Ethics Board (JFREB)

**Re:** Protocol #J2010:064  
"Enhancing the Safety-net: The Role of Green Micro-Credit in Rural  
Diversification and Women's Empowerment in Bangladesh"

Please be advised that your above-referenced protocol has received human ethics approval by the **Joint-Faculty Research Ethics Board**, which is organized and operates according to the Tri-Council Policy Statement. This approval is valid for one year only.

Any significant changes of the protocol and/or informed consent form should be reported to the Human Ethics Secretariat in advance of implementation of such changes.

**Please note:**

- if you have funds pending human ethics approval, the auditor requires that you submit a copy of this Approval Certificate to Eveline Saurette in the Office of Research Services, (e-mail [eveline\\_saurette@umanitoba.ca](mailto:eveline_saurette@umanitoba.ca), or fax 261-0325), including the Sponsor name, before your account can be opened.
- if you have received multi-year funding for this research, responsibility lies with you to apply for and obtain Renewal Approval at the expiry of the initial one-year approval; otherwise the account will be locked.

The Research Ethics Board requests a final report for your study (available at: [http://umanitoba.ca/research/ors/ethics/ors\\_ethics\\_human\\_REB\\_forms\\_guidelines.html](http://umanitoba.ca/research/ors/ethics/ors_ethics_human_REB_forms_guidelines.html)) in order to be in compliance with Tri-Council Guidelines.