Flooded Forest and Livelihoods of the Local Community in Jamalganj, Bangladesh: Lessons Learned from Swamp Forest Restoration in Sunamganj (SFRS) Project

Farjana Ferdous

A Thesis Submitted to the Faculty of Graduate Studies of the University of Manitoba

in Partial Fulfillment of the Requirements for the Degree

Master of Natural Resources Management (M.N.R.M)

Natural Resources Institute
Clayton H. Riddell Faculty of Environment, Earth and Resources
University of Manitoba
Winnipeg, Canada

Abstract

The purpose of this research was to understand the mechanism of Swamp Forest Restoration in Sunamganj (SFRS) project for the purpose of analyzing the linkages between natural resource conservation and livelihood security, its impacts on major capital assets of local community, and the views and perspectives of different stakeholders. I applied the Sustainable Livelihood Approach (SLA) Framework for the analysis. The study followed a qualitative research approach which was supplemented by quantitative data. It was found that local community members were mobilized by the SFRS project in four selected areas: i) conservation and management of flooded forest, ii) capacity building activities, iii) providing Alternative Income Generating (AIG) activities, and iv) raising awareness. The project activities were found useful in building natural, social and human capitals of the project participants. However, limited community participation was found, perhaps due to variations of opinion among stakeholders regarding the SFRS project and its activities.

Acknowledgements

I take this opportunity to acknowledge the support and cooperation I received of many individuals and organizations during the course of my thesis research. First, I would like to thank the villagers of Rahimapur forest for their spontaneous participation and willingness to share their thoughts and experience with me. I specially acknowledge the help of Jesmin Akhtar, Ashim Talukdar, Nirmal Roy and Shankar Das (and their families) for their cooperation in arranging focus group discussions and mobilizing people. I would like to thank the Centre of Natural Resources Studies (CNRS) personnel of Sunamganj branch, especially Mohammad Shafiqul Islam and Shamim for providing logistical support during the field data collection.

I reserve special thanks to my academic adviser, Dr. C. Emdad Haque, for his encouragement throughout this academic journey. His continuous guidance and conceptual inputs made my journey easier. This research would not have been possible without his guidance and inspiration.

My committee consisted of Dr. C. Emdad Haque and Dr. Fikret Berkes from the Natural Resources Institute, University of Manitoba, and Dr. Prateep Nayak from the School of Environment, Enterprise and Development, University of Waterloo, and Dr. Mokhlesur Rahman, Executive Director of the Centre for Natural Resource Studies (CNRS). I was fortunate to have them on my committee. I extend my sincere thanks to all my committee members for their positive feedback, guidance and advice throughout the research.

I am thankful to Dr. Fikret Berkes for his financial support through the Canada Research Chair Program on Community-based Resource Management during my study. I extend special thanks to Dr. C. Emdad Haque for his financial support to field research activities and to my studies during

my stay in Canada from SSHRC Insight Grants and the Graduate Enhancement of Tri-Council Stipends (GETS). I would not be able to complete my degree without their financial supports.

I am very fortunate to have a team of extraordinary lab members: Mahed-Ul-Islam Choudhury, Mohammed Salim Uddin, Rezwanul Hoque, Tawfiq M. Hasan, Showaib Shikder, Sabrina Islam and Sadia Mustafa. I would like to thank them for their inputs, ideas, and suggestions into my research. I am thankful to Tamara Keedwell, Dalia Naguib, Shannon Wiebe, and Jacqueline Rittberg of the Natural Resources Institute for their willingness to assist me at all times. I deeply appreciate their kind and genuine gestures. I would also like to thank Glen Hostetler (Natural Resource Institute, University of Manitoba) for editing my thesis.

I would like to thank my relatives and friends in Canada: Afzal Hossain Rupak, Zannatul Ferdous, Dr. Mohammad Khalad Hasan, Afrina Rahman, Dr. Mohammad Al-Amin Sadek, Shahnaz Parvin, Kaiser Moon, Naima Jahan, Abul Khair, Neel Tanji, Sanjana Shahnawaz, Rubiat Shakil, Monisha Ehsan, Dr. Debajyoti Mondal, Purbasha Mistry, Zubair Ahmed, Maliha Ahmed and Ferdous Ahmed for their encouragement and supports. I thank them for standing by me in all circumstances.

I would like to sincerely acknowledge the unconditional support of my family members during my Masters program. My parents deserve the best of my gratitude for always being there and praying for my success. My brothers Enamul Haq and Shajadul Haq and my sister Jawata Afnan have always been a tremendous source of inspiration. I also thank my sisters-in-law, Jannatul Ferdous and Nurjahan Bilkish, niece Nushba and nephew Ryan for their love and support. Finally, I would like to dedicate this thesis to my father, Md. Zahirul Haq.

Table of Contents

List of Tables

List of Figures

Glossary

Baors	Oxbow lakes, formed by dead arms of rivers
Beels	Perennial water bodies
Dhol Kolmi	A semi-woody shrub
Haor	A bowl or saucer-shaped shallow depression that looks like a single water body
Jalmohal	Fishing location given by permit in a water body
Murta	"*Schumannianthus dichotoma*", a rhizomatous shrub used as raw material for making mats
Shitol pati	Cool mat made of *murta*, this type of mat is cold by nature
Union Parisad	Local elected government body at the village level headed by Chairperson
Upazila	Smallest administrative unit of the government administrative system

Acronyms

AIG	Alternative Income Generation
AF	Arannayk Foundation
BBS	Bangladesh Bureau of Statistics
BRAC	Bangladesh Rural Advancement Committee
CARE	Cooperative for Assistance and Relief Everywhere
CBD	Convention on Biological Diversity
CBO	Community- based organization
CBFM	Community-based Fisheries Management
CBRM	Community-based Resource Management
CBWM	Community-based Wetland Management
CWBMP	Coastal and Wetland Biodiversity Management
CMC	Co-management Committee
CNRS	Center for Natural Resources Studies
DC	Deputy Commissioner
DFID	Department for International Development
FAO	Food and Agricultural Organization
FGD	Focus Group Discussion
GDP	Gross Domestic Product
KII	Key Informant Interview
ICS	Improved Cook Stove
IRG	International Resource Group
IPAC	Integrated Protected Area Co-management
LNP	Lawachara National Park
MACH	Management of Aquatic Systems through Community Husbandry

MDG	Millennium Development Goals
MoEF	Ministry of Environment and Forest
NBSAP	National Biodiversity Strategy and Action Plan
NGO	Non-government Organization
NSP	Nishorgo Support Project
NTFP	Non Timber Forest Product
PIC	Project Implementation Committee
PTA	Parent Teacher Association
SDGs	Sustainable Development Goals
SEMP	Sustainable Environment Management Program
SFRS	Swamp Forest Restoration in Sunamganj
SLA	Sustainable Livelihood Approach
SFP	Social Forestry Program
SNP	Satchari National Park
SSI	Semi-structured Interview
UNDP	United Nations Development Program
USAID	United States Agency for International Development
VGD	Vulnerable Group Development
VGF	Vulnerable Group Feeding

Chapter 1: Introduction

1.1 Background and Context

Human activities have caused biodiversity loss, with species extinction rates from 100 to 1000 times higher than before (Pimm, 1995). Consequently, prioritizing conservation was essential to minimize biodiversity loss (Brooks et al., 2006). The Millennium Development Goals (MDGs) were designed to promote efforts to ensure environmental sustainability and to improve people's lives, among other priorities (Sachs, 2005). Similarly, concern about the decline of global biodiversity and degradation of ecosystem services (Mace, 2005) gave rise to the Convention on Biological Diversity (CBD) in 1992. In 2002, the CBD target "to achieve by 2010 a significant reduction of the current rate of biodiversity loss" was incorporated into the MDGs (Sachs et al., 2009; P: 1502). Bangladesh signed and ratified the CBD in 1992 and 1994, respectively. Furthermore, Bangladesh has ratified, accepted and acceded to the Ramsar Convention on Wetlands, the Climate Change Convention and the Convention to Combat Desertification (Bevanger, 2001). The country also developed a National Biodiversity Strategy and Action Plan (NBSAP) in 2004 for conservation of biodiversity. After the termination of the MDGs in 2015, Bangladesh signed on to the United Nations initiative to work towards achieving Sustainable Development Goals (SDGs), which emphasize protecting, restoring and promoting sustainable use of ecosystems, among the 17 goals, by 2030. Bangladesh, therefore, adheres and commits to the conservation of biodiversity and the environment.

The connections between poverty and the environment are complicated (Dasgupta, 2002). Some efforts have been undertaken to establish a relation between development and biodiversity. However, community-based resource management (CBRM) is an approach where both 'development' and 'conservation' perspectives are given similar priority (Berkes, 2004; 2007).

Community-based resource management approaches are based on the premise that local people have more interest in managing natural resources in a sustainable manner than the state; that local communities are more informed about the complications of local ecological processes and practices; and that local people are more capable of managing natural resources through local or traditional forms of access (Brosius et al., 1998).

In recent decades, a paradigm shift in the approach of natural resource management has been seen through the move from state-based, top-down management to people-centered policies, bottom-up planning processes, and decentralized governance (Agrawal and Ostrom, 2001). Such a paradigm shift was needed because of the negative impacts of state controlled approaches that led to massive degradation of resources, alienation of local resource users and the increasing need for a change in the resource management approach that favors community empowerment (Agrawal and Gibson 1999). CBRM has been implemented in developing countries since the 1990s (Persha et al., 2011; Agrawal and Ostrom, 2001) and is still continuing as an important and expanding conservation approach (Bowler et al., 2010). Bangladesh, a developing country in South Asia, has also responded positively towards this approach in recent decades and has been adopting co-management programs in some parts of the country with support from national and international organizations.

Bangladesh is endowed with many diverse and complex wetland ecosystems that are rich and possess global significance (Chan, 2004). Because of its geographic location, Bangladesh is fortunate to have rich inland aquatic environments that support flooded forests, natural lakes, freshwater marshes and thousands of migratory birds (Chan, 2004). The north-eastern regions of the country are low lying and consist of a bowl shaped depression containing many wetland areas, locally known as *haor* (Chakraborty, 2006). Forests in the wetland area of Bangladesh are typically

known as freshwater flooded forests or “swamp forests”, which get flooded and/or inundated during monsoons. Freshwater flooded forests are different from the mangrove forests that are generally found along coastal areas where they grow abundantly in brackish water and saline soil and are subject to periodic fresh- and salt-water inundation. Flooded forests are locally called *Hijol-Koroch Baag* as the most commonly found tree species are called *Hijol* (*Barringtonia acutangula*), and *Koroch* (*Pongamia pinneta*). Seasonal flooding and recession in the flooded forest and reed beds make the areas rich for floral and faunal species, which are unique for wetland ecosystems.

Flooded forest ecosystems have remarkable social, ecological as well as economic values and benefits as they accommodate immense volumes of biological resources, on which local people are greatly dependent for their livelihoods. Local communities are dependent on these forests for fuel wood, fodder and house-building materials. Flooded forests are a vital source for many life-supporting medicinal plants such as *Shotomuli*, *Onontomul* and *Amrul* for local people. Poor community members of wetland areas are highly dependent on these natural sources of medicinal plants. Rural communities, particularly in the developing world, gain their livelihoods from flooded forest resources that include fish, aquatic fruits and wildlife. And more importantly, flooded forests also protect villages and homesteads from wave erosion during the monsoon flooding periods. Therefore, degradation of flooded forests negatively affects the production of fish and other aquatic resource, villagers become more vulnerable to wave erosion and the sources of livelihoods decrease (Khan, 2004).

Unfortunately, flooded forests have declined considerably over the years due to pressures stemming from deforestation and poor land management, industrial development and the leasing system (Thompson, 2008). Rahman and Islam (2007) noticed that the lack of knowledge regarding

the inherent causes of flooded forest depletion is one of the main reasons for the declining productivity of flooded forests in Bangladesh. Before the leasing system, a large number of these flooded forests were under private possession as jointly owned property. As a result, the flooded forests were ignored by the government and most of them have been converted to agricultural lands (Chakraborty, 2006).

In Bangladesh, wetlands are generally considered a source of revenue earning and are mainly managed by the Ministry of Land (MOL). MOL leases out parts of rivers, *haors*, *baors* and *beels* that have potential as a *Jalmohal* (fishery estate) for about three to five years to the highest bidder through an open bidding system. Most of the time, politically powerful leaders, their agents or locally rich people happen to be the leaseholders of *Jalmohal*. Under the leasing system, the customary rights of the local communities are denied. In such an arrangement, the property rights of the wetlands are changed from communal property to private property (Khan, 2012). Similarly, the leasing system is applied to several freshwater flooded forests, while some are leased out to environmental organizations. For example, some segments of flooded forests in the north-eastern area are leased out to the Center for Natural Resources Studies (CNRS) for community-based management. Some of these are: flooded forests of Gobindapur, Manikkhila, Tahirpur and North Shahpur of Sunamganj district.

The management of wetland and flooded forest resources has been neglected for a long time, and the sustainable management of natural resources was not at the forefront of policy domains. Recently, stakeholders in Bangladesh, including the civil society, government, non-governmental organizations (NGOs) and other enlightened sections of the community, have become seriously concerned about these issues and have called for immediate actions for the rejuvenation of wetlands and conservation of flooded forests (Hoque et al., 2005).

The CNRS, a non-governmental environmental organization, is a pioneer organization in Bangladesh in managing wetland and flooded forest resources under the broad theme of participatory resource management. CNRS has been working on community-based restoration projects in Bangladesh since 1993. During its 24 years lifespan, CNRS has worked on many wetland management projects with the support of donors, governmental and non-governmental organizations including the Ministry of Environment and Forest (MoEF), the UK Department for International Development (DFID), the International Union for Conservation of Nature (IUCN), the United States Agency for International Development (USAID), the United Nations Development Program (UNDP), the Food and Agricultural Organization (FAO) and the World Bank. CNRS identified the social and ecological importance of degraded flooded forests and took the initiative of working for sustainable natural resource management through the effective participation of local communities. CNRS, in association with stakeholders (i.e. community members) and other donor organizations, has designed and implemented projects concerning the restoration of wetlands and degraded flooded forests in north-eastern Bangladesh. Some notable projects implemented by CNRS with its partner organizations are Community Based Wetland Management (CBWM), Community Based Fisheries Management (CBFM), Coastal and Wetland Biodiversity Management (CWBMP), Management of Aquatic Ecosystems through Community Husbandry (MACH) and Sustainable Environment Management Program (SEMP).

In 2009, CNRS and another Bangladeshi NGO, the Arannayk Foundation (AF), initiated a project on conservation and restoration of flooded forests located in the north-eastern part of the country titled the "Swamp Forest Restoration in Sunamganj" (hereafter the SFRS project). The SFRS project included two flooded forests of Sunamganj[1]; Rahimapur-Hariharpur flooded forest

[1] *Sunamganj* district includes 11 sub-districts, *Jamalganj* is one of them

(hereafter Rahimapur forest) is one of them. The project was launched with a vision for ensuring restoration of degraded flooded forests and other degraded sites through the effective participation of local communities. CNRS and AF have completed two phases of the SFRS project and are presently continuing restoration activities at Rahimapur forest (CNRS, 2015).

My research focuses on this naturally grown Rahimapur forest, which is located across two Union Parishads, Beheli and Sachna Bazar of Jamalganj[2] sub-district. The forest covers an area of 44.6 hectare (CNRS, 2009), in Sunamganj district, Sylhet[3]. This government-owned flooded forest was dominated by two species locally called *Hijol (Barringtonia acutangula)* and *Koroch* (*Pongamia pinnata)* (shown in Figure 3.1).

Seven adjacent villages were directly or indirectly dependent on this 200 years old forest. Rahimapur forest contained very dense forests in the past; there were approximately 25,000 *Hijol* and *Koroch* trees about 100 years ago (CNRS, 2009). There is no recorded information or data available at the Sunamganj district administrative premises in relation to Rahimapur forest prior to 1971. According to the elderly residents of the community, it was first leased out in 1972-1973. After the first leasing out, this forest was consecutively leased out for 5 year periods by the district administration until 2008. However, successive leases in previous years and community people's dependency on the forest for collecting fuel wood and resources, cattle grazing, fishing inside the forest, and other land use changes destroyed this once biodiversity-rich flooded forest and reduced its total standing trees from 25,000 to 816. Such a decline in standing trees caused serious disruption of natural and environmental resources, and even community people's livelihoods (CNRS, 2009).

[2] *Jamalganj* sub-district includes 5 *Union Parishads*; *Beheli* and *Sachna Bazar* are two of them
[3] Greater *Sylhet* includes the districts of *Sylhet, Sunamganj, Habiganj, and Moulivibazar*

According to the same report, in the recent past a large part of the forest was occupied, under the permission of the local government, by local people who built their houses in the forest. In addition, illegal encroachment as well as agricultural expansion have also contributed to the degradation of this forest. As a consequence, biodiversity of this ecosystem has declined. Such degradations are responsible for reductions in fish habitat and loss of valuable wetland-based flora, fauna and non-timber forest products in this forest (CNRS, 2009).

Regarding natural resource conservation and management, a number of studies have been carried out in the context of wetland communities in Bangladesh. However, there has rarely been any effort to investigate the potential of co-management projects in flooded forest conservation and management practices, as well as in creating livelihood options in the project area. The implications of community-based resources management and livelihood improvement has already been established in various parts of the world (Berkes, 2004). Underlying, triggering forces for this thesis research project are the renewed interest in environmental sustainability through flooded forest conservation and management, and the critical need in Bangladesh for creating livelihood options for the local poor by providing income generating activities to alleviate poverty and conserve forest resources. Therefore, I will first study how the SFRS project has engaged local community members in its activities by focusing on forest conservation and livelihood development. Then I will examine how the activities initiated by the SFRS project have affected various assets of communities' livelihoods. Finally, I will examine communities' views, thoughts and experiences of working with project activities and managing their livelihoods under the SFRS project.

1.2 Purpose and Objectives of the Research

The purpose of the study is to investigate conservation and restoration efforts by the stakeholders and their role in enhancing the resilience of local social-ecological systems within which local communities are embedded. The specific objectives of the research are:

1. To describe the SFRS project, its mechanisms, and activities in linking natural resource conservation and livelihood security.
2. To delineate how livelihood strategies and outcomes are affected by capital assets under the framework of the Sustainable Livelihood Approach (SLA); and
3. To analyze views and perspectives of stakeholders on flooded forest management strategies and map the lessons learned from the SFRS project implementation.

1.3 Significance of the Research

In the north-eastern regions of Bangladesh, the direct rainfall from the mountains of Meghalaya helped to developed an ecosystem where different small patches of flooded forest grow. Because of this regular adequate rainfall and water supply from the upstream mountainous areas, this region has a distinctly different climate and resultant biodiversity from the rest of the flooded forests. These flooded forests are extremely important as they support a large and diverse set of flora and fauna on which the livelihoods of local communities depend. In the district of Sunamganj, about 72 patches of flooded forest are found covering an area of about 1212 hectares. The forest patches range from 2 hectares (Ratansree flooded forest in Tahirpur *Upazilla*) to 459 hectares (Ikordair kanda flooded forest in Tahirpur *Upazilla*) covering the five *Upazilla*s of Sunamganj (CNRS, 2012). Though the freshwater flooded forest covers only 0.42% of the country's total forest area (Forest Department, 2017), its unique ecosystem makes it very significant for sustainability and conservation issues.

Most of the flooded forests located in the north-eastern region of Bangladesh, rich in species like *Hijol (Barringtonia acutangula)* and *Koroch* (*Pongamia pinnata)* along with many associated species, are now almost devoid of any natural forest except in some small areas. Such degradation has resulted in biodiversity loss, reduction in fish habitat, loss of wetland-based flora and fauna as well as social and economic instability. However, NGOs like CNRS and AF have undertaken initiatives, such as the SFRS project, for restoring these forests. The primary goal of SFRS project was to promote the conservation of biodiversity in Rahimapur forest through a community-based management approach. In addition, one of the project's three key objectives was to build awareness and capacity of community members for the protection and conservation of flooded forest and to improve the living standard of local stakeholders. Therefore, the project promoted alternative income generation (AIG) activities and other training and organizational development programs to engage community members. The project placed special emphasis on women's participation in every aspect of project activities to improve their livelihoods by reducing their dependency on forest resources.

The SFRS project in Rahimapur forest completed an eight year long journey in 2017. But a restoration project alone cannot succeed unless the community members are inextricably engaged with the project's activities. Successful stakeholder participation is considered as a vital tool in community-based natural resource management. In this context, examining the SFRS project's mechanism for stakeholder engagement through their activities and its impacts on communities' livelihood strategies and outcomes will provide useful feedback for the project. As well, identifying the current situation of communities' livelihood sources and their forest dependency may serve as an important source of information for the Project members. It is also important to study community members' experiences and perceptions, the challenges and barriers

they face while working in a co-management project, and the overall outcomes of the project. Furthermore, documenting experiential learning, experiences, and feedback from project stakeholders will be impactful for the SFRS project managers in taking further initiatives. This research will help to strengthen conservation and restoration project operations and develop further initiatives by acknowledging communities' knowledge, their priorities, and concerns as findings of the research.

1.4: Methods and Research Plan

To conduct my research work, I applied a qualitative research design following a case study approach (Yin, 2013). Data were collected through participatory methods and tools. Involvement of community members and stakeholders of the SFRS project was required in the data collection procedure to address my research objectives. As participatory research methods are helpful in understanding rural livelihoods and gathering information about people's views and perspectives about local problems and solutions (Chambers and Blackburn, 1996), I adopted such an approach throughout my data collection and research process.

I selected seven villages in the project area and conducted household surveys and interviews with semi-structured questionnaires to obtain insights about communities' livelihoods, household socio-economic status, impact of the SFRS project, women's empowerment, and community development. I employed several participatory rural appraisal (PRA) tools including participant observation and focus group discussions (FGDs) for collecting qualitative data (Chambers, 2004). Household surveys were carried out in order to collect quantitative data. Data collection also involved extensive key informant interviews (KIIs) and semi-structured interviews. After conducting interviews, FGDs, and informal visits, I wrote daily field notes based on participants' discussions and my observations relevant to my research.

Research Plan

The research took place over a period of 4 months from July to October, 2016. It was conducted in three phases:

Phase 1: Introductory meetings with community members and CNRS and AF officials (First two weeks of July, 2016)

In the first phase, discussions were carried out with CNRS, AF and local community members to determine the scope of my research. During this time, I attended meetings with community-based organization (CBO) members that were organized by CNRS. The meetings gave me the opportunity to informally chat and discuss various issues with the local community. It helped me to identify the potential key informants from the community as well as CBO members, CNRS and AF members.

Phase 2: In-depth field work (Three months; from mid- July to mid- October, 2016)

After becoming familiar with the community, CNRS and AF members, I started in-depth data collection through different stages. Household surveys were conducted with households from the seven villages using a snowball sampling method. While doing household surveys, I had the opportunity to closely monitor how the villagers manage their livelihood activities. I closely observed how a few families adopted AIG activities and grew crops and vegetables. A total of five FGDs, 25 KIIs, 40 semi-structured interviews and 70 household surveys were conducted during this in-depth field work period.

Phase 3: Verification and workshops (15-25 October, 2016)

A small workshop was organized with active participation of local community, CBO and CNRS members to validate and verify the collected information. The primary findings of my research were disseminated among them and feedback and comments were gathered from the participants.

1.5 Organization of the Thesis

The thesis is organized into seven main chapters. The first chapter provides a general overview of the thesis by explaining the research context, purpose and objectives, methods and the significance of the research. Following the introduction, chapter two discusses and describes the concepts of the SLA and its major capitals, and the community-based resource management approach. Chapter three outlines the study area and the research methods and methodologies that were followed in conducting this study.

Stakeholder participation is considered a significant element of any development project. For co-management programs, adoption and promotion of the project activities by community members are essential. In chapter four, the process and level of stakeholder participation in conservation and management activities, SFRS Project-initiated AIG activities, the development of a community based organization (CBO) and its performance are discussed in detail. Chapter five studies how livelihood strategies and outcomes in the project area are affected by capital assets under the framework of SLA. Chapter six analyses the views and perspectives of all the stakeholders regarding the project activities and maps the lessons learned from the project implementation. Chapter seven provides a synthesis of all the key findings that have been discussed in the previous chapters, along with feedback collected from the participants for further improvement of Project activities and resource management in Rahimapur forest.

Chapter 2: Literature Review

This chapter first critically reviews the idea of CBRM, and how this approach is being implemented with active engagement of participants, especially women in Bangladesh. Then the chapter offers a discussion on the SLA framework and its components. The differences between the concept of experts and stakeholders regarding participatory management are also reviewed here.

2.1: Community-Based Resource Management (CBRM)

2.1.1: CBRM Approach

CBRM is a simple and attractive strategy in which communities, defined by distinct spatial boundaries, can identify their common interests and manage their natural resources in a sustainable and efficient manner (Blaikie, 2006). This is a medium for improving the social and economic standards of local communities by accumulating traditional and local knowledge that has developed from interactions of nature and people over generations (Berkes, 1994). Kellert et al. (2000) defined CBRM as a commitment that engages community people with local institutions in conserving and managing natural resources, which legitimizes indigenous resource and property rights. They suggest that social and community forestry, community wildlife management, cooperative or co-management, buffer zone management and multipurpose community projects are included in CBRM and share some common characteristics, for example, the inclusion of traditional values and ecological knowledge and decentralizing power from central or state governments to indigenous organizations as well as local people.

2.1.2: Global Shift to CBRM

In the early 1970s, CBRM began to receive attention as researchers were inclining themselves towards more inclusive, people-oriented, community-based approaches. This was attributed to the failures of some large-scale, capital-intensive, and government-planned conservation and development projects (Ghimire & Pimbert, 1997). During the 1970s-1980s, the drive of grassroots initiatives was focused on community-based approaches in order to find solutions to larger environmental problems (Chambers, 1983). Practitioners and academics also emphasized that as local communities already used, relied on and managed natural resources, they were most suited for conserving them, with some additional local supports. Hence, they began to work with local resource users by ensuring that conservation approaches meet scientific objectives as well as local livelihood aspirations (Ostrom, 1990).

CBRM practitioners attempted to make nature and natural resources functional to local communities through markets. This was in contrast to community members considering CBRM as a means of gaining control over natural resources for livelihood management and conservation (Western and Wright, 1994). Initially, CBRM developed interests in agriculture, forestry and water management by encouraging the involvement and enhancement of the power and decision-making roles of community people. Later, it further developed interests in the management of protected areas and national parks with the goal of ensuring the long term sustainability of these entities (Stevens, 1997).

2.1.3: Wetlands and Flooded Forests in Bangladesh

Bangladesh was once called a "land of water and wetlands" and most of its large back swamp areas (*Haors)* were covered with flooded forests including reed beds. Wetlands made significant contributions to this country in socio-economic, industrial, ecological and cultural contexts (Islam

and Gnauck, 2007). They provide habitat for a variety of resident and migratory waterfowl, threatened and endangered species as well as nationally and internationally important species (Islam and Gnauck, 2009). In Bangladesh, wetlands usually are perennial and include ponds, watersheds and rice-patty fields. They not only support a large number of flora and fauna, but also contribute to the socioeconomic life of millions of rural people by providing opportunities for employment, food and nutrition, fuel, fodder, transportation and irrigation (Nishat, 1993). They are also crucially important for human settlements, biodiversity conservation, fisheries, agricultural diversity, navigation and communication, flood water management, water reservoirs, ecotourism development and indigenous cultural conservation (Islam, 2010). The total area of wetlands in Bangladesh is estimated to be 70,000 to 80,000 km^2, i.e. about 50% of the total national land (Khan et al., 1994). According to Islam (2010), almost half of the country's population are directly dependent on wetland resources. However, due to excess pressure from overpopulation, agricultural expansion, the previous leasing system and nominal management initiative from the state, these wetlands as well as the forests have been facing serious threats, with most of them being encroached by local people.

2.1.4: Evolution of CBRM in Bangladesh

The concept of CBRM was exemplified with the term "social forestry" in the 1970s in response to the drawbacks and failures of the top-down, expert-driven management approaches to various natural resources such as forest, land and water (Agrawal, 2001; German et al., 2008; Ostrom, 1990). In Bangladesh, the "participatory approach" in forest management was first introduced in the Forest Policy of 1979, which asserted that a participatory approach should be followed in Government-owned forest land and plantations on marginal lands (Government of Bangladesh, 1979). The first community forestry project was aided by the Asian Development Bank, located

in the northern part of the country. Although marginal lands like roadsides and the sides of the railway lines were used initially by the project, social forestry was practiced later in degraded forest areas such as in national parks. Since social forestry programs are designed to have a benefit sharing process, under which participants could get their share of income, it made participants more interested in the program (Muhammed, 2005). With the introduction of social forestry, the participatory approach has received momentum across the country regardless of many obstacles that include a lack of experienced human resources, organizational capabilities, stakeholders' participation and budgetary arrangements. The Government also highlighted social forestry by conceiving the idea of participatory management to alleviate poverty and improve socio-economic development. The chronological development of the social forestry program is shown in Table 2.1.

Table 2.1: Chronology of Social Forestry in Bangladesh

Programs	**Period**	**Stage**
1. Taungya System (Introduced from Myanmar)	1871	Conceptual stage
2. Forest Extension Service Phase I	1967	
3. Betagi-Pomora Community Forestry Project	1979	Experimental Stage
4. Development of Forestry Extension Service Phase II	1980-85	
5. Community Forestry Project	1982-87	Large-scale social forestry established
6. Jhoomia Rehabilitation Program in Chittagong Hill Tracts Phase I	1979-89	
7. Jhoomia Rehabilitation Program in Chittagong Hill Tracts Phase II	1990-95	
8.Thana Afforestation and Nursery Development Project	1987-95	Mass Production
9. Extended Social Forestry Project (ESFP)	1995-97	

10. Coastal Greenbelt Project	1995-2000	
11. Forestry Sector Project	1997-2004	

(Source: Forest Statistics, Bangladesh 2003; taken from Muhammed et al., 2005)

In 1994, social forestry was specially highlighted in the Forest Policy of Bangladesh and a clear guideline was formulated for this purpose. According to the policy, social forestry planning should follow the "bottom-up" approach where the local community will lead the management program. But, in reality, the people at the grassroots levels were hardly included in the planning process (Muhmmed, 2005).

According to Sen and Nielsen (1996), the co-management approach provides a wide variety of collaborative arrangements based on the role of the government and the forest users. They argued that the "co-management approach," which was consultative in the past, should be co-operative in future. Pomeroy (1998) observed that co-management should not be treated as a unique model or a single management approach. A co-management approach should be an evolutionary process of resource management that is adjustable over time with changing conditions and revolves around the concepts of democratization, social empowerment, decentralization and power sharing. It should be a flexible strategy that encourages and allows "action on participation, conflict-management, power sharing, leadership, dialogue, decision-making, knowledge-generation and sharing, learning, and development among resource users, stakeholders and government" (Safa, 2006; P 209).

2.1.5: Engagement of NGOs in CBRM Projects in Bangladesh

In Bangladesh, the social forestry program has been largely driven by donor-funded projects and is considered a donor-funded activity by the Forest Department (Muhammad et al., 2005). In recent decades, NGOs have implemented participatory management activities with the local communities

under various forms of co-management, especially concerning under-used or unused marginal lands. NGOs often collaborat with national and international organizations, including the Bangladesh Forest Department, the other relevant national ministries, UNDP, USAID, the World Bank and Cooperative for Assistance and Relief Everywhere (CARE)- Bangladesh. A good number of NGOs are currently working in various sectors in Bangladesh with the aim of socio-economic development of rural communities and biodiversity conservation. Social forestry activities performed by NGOs follow a framework of co-management in which the local community was considered the nucleus and public agencies were the implementers (Safa, 2006). Currently, more than 100 local and national NGOs are working in social forestry programs in Bangladesh (BBS, 2007). These NGOs work on different types of projects/programs, with the help of international organizations, among which participatory forest management falls within rural development programs. Under such participatory programs, NGOs introduce their group members to plantation activities as well as provide them with technical supports and credit, and in turn these activities contribute to their self-sufficiency (Zaman, 2011). NGOs try to initiate bottom-up instead of top-down approaches as had been the traditional practice in development (Hasan, 2015). According to FAO (2007), when rural communities surviving on natural resources are trained, coordinated and granted legal rights using a bottom-up approach, they show enormous human potential for natural resource management.

2.1.6: Examples of CBRM Projects in Bangladesh with Active Participation of Local People

In 2002, the Government of Bangladesh developed a co-management pilot program in several protected areas. One such initiative was the Nishorgo Support Project (NSP), with funding from USAID and implementation by the International Resources Group (IRG) and allied local

NGOs. The project was implemented until 2007 and was then re-launched in 2009 based on earlier experience and lessons learned under the name Integrated Protected Area Co-management (IPAC). Several initiatives were undertaken to ensure the active participation of local people during the implementation of these projects. The major initiative focused on providing economic incentive in the form of AIG options, such as nursery raising, fisheries and livestock and poultry rearing. The local people were also involved in forest patrolling and eco-tour guiding (Mukul et al., 2014). Both the NSP and IPAC programs exhibited positive influence in species conservation in the park area. The projects encouraged local people toward forest conservation through economic incentives, and ensured local participation in park governance. However, lack of coordination among different stakeholders, inadequate support for the project, absence of women's leadership in the management committees and other limitations constrained the development of effective co-management practices in these projects (Khan, 2008).

2.1.7: Women's Participation in CBRM Projects in Bangladesh

Women are generally concerned about environmental issues and more interested in joining environmental groups compared to men (Merchant, 1995; Steel, 1996). Therefore, local women should be encouraged to be included in co-management projects and attempts should be taken to teach them about the possible impacts of co-management projects on their livelihoods. Their engagement in natural resource management is essential to ensure balanced decision making. Engagement of women in co-management projects, through need-based and skill-based training programs, can help to reduce their dependency on forest resources (Shewli, 2008).

Subhani (2008) reported that after engaging in co-management activities in Satchari National Park (SNP), a majority of women quit the firewood collection activities. This was because they thought that their participation in co-management activities would increase their skills and

decision making abilities, and their family members and neighbours would show respect to them. In Lawachara National Park (LNP), nearly half of the female members participated in co-management and learned to earn income independently. Shewli (2008) found that the women of this Park categorized "saving money" and "preserving biodiversity" as their main reasons for joining the co-management program. In Chunati Wildlife Sanctuary, improvement in the socio-economic status of CBO members was found to improve after participating in the co-management program. Their participation in co-management made them socially empowered and increased their ability to interact with community members (Hoque, 2008).

Sultana and Thompson (2008) further offered some positive findings of women's engagement in co-management programs. When women participated in wetland management committees in the floodplains, the diversity of fish species and the income from aquatic species increased as a result of their activities. They also revealed that acceptance of fish species was higher in places where both male and female members participated in decision making compared to other places where women played no role. They described the example of *Goalkhola beel*, where five fish sanctuaries were protected in every dry and early monsoon season from 1997 to 2002. The sanctuaries were guarded by women during day times and by men at nights.

2.1.8: Current Status of Flooded Forest Restoration in Bangladesh

In Bangladesh, freshwater flooded forest has been reduced significantly over the years and only a small portion is still left in the north-eastern parts of the country. CNRS, a locally active environmental NGO, has identified the ecological importance of degraded flooded forest and taken the initiative to restore these degraded forests. In association with stakeholder groups, DFID, IUCN, and other NGOs such as the Arannyak Foundation, CNRS has set the goal to restore, conserve and enhance sustainability of degraded flooded forests. CNRS followed an integrated

approach with participation of the local people and implemented the restoration of some degraded flooded forest in several *haors* (a wetland ecosystem which is a bowl shaped shallow depression, also known as a back swamp) of Sunamganj District. These included the *Pagnar* and *Sanur-Dakuar haor* of Sunamganj district and in *Hakaluki haor* of Moulvibazar District (Chakraborty, 2006).

CNRS has been implementing a project named Swamp Forest Restoration in Sunamganj (SFRS) since 2009. It covers a major portion of flooded forests of north-eastern Bangladesh. Flooded forests of Gobindapur, Rahimapur-Hariharpur, Manikkhila, Tahirpur, Jiragtahirpur and North Shahpur of Sunamganj district are being managed by the local people under the guidance of CNRS for the last seven years. The objectives of this project include promoting community-based restoration and flooded forest management, regenerating awareness and building the capacity of local communities as well as conservation of flooded forests. To influence national policy, process and structures in favour of flooded forest restoration and conservation were also major concerns of this project (Arannayk Foundation, 2018).

2.2: Sustainable Livelihood Approach (SLA) Framework

2.2.1: SLA and its Components

Conceptually, "livelihood" is the means, activities, entitlements as well as assets by which people earn a living. In this context, assets are specified not only as biological or natural but also as human, social and physical capital (Elasha et al., 2005). A livelihood is considered sustainable when it can cope with and recover from stresses and shocks, and can manage and increase its assets and capabilities for both present and future without compromising the base of natural resources. The term "sustainable livelihood (SL)" was introduced by the Brundtland Commission in 1987 regarding "resource ownership and access to basic needs and livelihood security" (Elasha et al.,

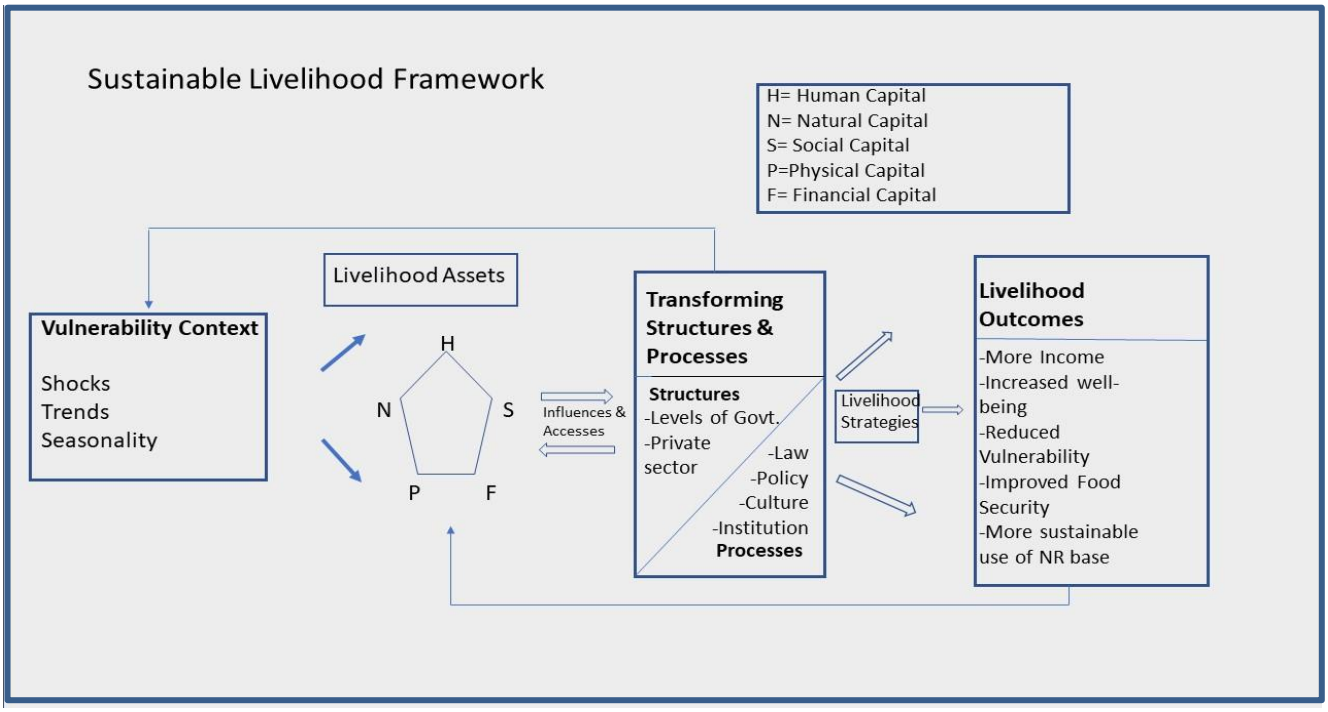
2005; P: 5). Chambers and Conway (1992) provided one of the most widely used definitions of SL. This definition is also used by the UK's DFID.

> A livelihood comprises the capabilities, assets (including both material and social resources), and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base. (Chambers & Conway, 1992, P: 5)

A variety of sustainable livelihood frameworks have been proposed by different organizations, such as CARE, UNDP and DFID. All these agencies use similar definitions of what constitutes sustainable livelihoods and also use SLA as a strategy towards poverty reduction. CARE and UNDP use the approach to facilitate the formulation and planning of programs and concrete projects; however, for DFID the SLA is more a basic framework for analysis than a procedure for programming (Krantz, 2001). It mainly places the focus on the poor people by engaging them in every phases of the planning process and by deeply respecting their beliefs and opinions. Above all, according to this framework, the poor people themselves define their goals, strengths and potentials Therefore, the SLA framework proposed by DFID is used in this study. This framework places the rural poor at the centre of a web of interconnected influence that affects the livelihood opportunities created for the people and their households (Xu et al., 2015). The main content of the diagram is a pentagon that consists of five types of assets: financial, human, natural, social and physical capital (Babulo et al., 2008; DFID, 1999; Fang, 2013). The SLA framework of DFID has five main parameters: i) vulnerability contexts, ii) livelihood assets, iii) transforming structures and processes, iv) the livelihood strategies that people employ, and v) livelihood outcomes (Figure 2.1).

In order to examine livelihoods of rural people, it is crucial to gain in-depth knowledge about the context in which the livelihoods evolve. People's livelihood and their access to and management of resources are often controlled by various external factors. For example, the vulnerability context is one of the most profound external factors that affects many facets of livelihood (DFID, 1999). Vulnerability context includes natural disasters (such as floods, droughts, earthquakes) or human-induced disasters (such as agricultural pests and diseases or conflicts) that interrupt a person's livelihood (Chambers & Conway, 1992; Cahn, 2002).

Figure 2.1: DFID Sustainable Livelihood Framework (Source: After DFID, 1999)



2.2.2: Important Assets of SLA

The SLA is concerned with people and seeks to gain practical understanding of their strengths and the process of converting this into positive livelihood outcomes. This approach is based on achieving positive livelihood outcomes; that is, it is important for the people to have a range of assets for livelihood security. One single category of assets is not sufficient to afford various

livelihood outcomes for a person. A person's livelihood is a complex combination of his/her ability, physical skill, social network, financial capability and the scope of their access to natural resources (DFID, 1999). These components are termed "capital" or "assets" of SLA by various scholars. As stated earlier, DFID has identified five main types of assets, and stated that if these assets are strengthened, a household's livelihood will be sustainable and will be able to deal with shocks and stresses in a better way. These assets are: human capital, social capital, physical capital, financial capital and natural capital (DFID, 1999).

2.2.2.1: Human Capital

Human capital is constituted by the quantity and quality of labor available. It is represented by the knowledge, skill, experience and ability of an individual to manage their livelihood following different livelihood strategies (DFID, 1999). At the household level, it is mainly determined by the household size, but also by knowledge, skill, leadership potential and health of the household members (DFID, 1999; Carney, 1998). Human capital is considered to influence the other four types of assets. Therefore, it is necessary not only for meeting its own needs, but also for achieving positive livelihood outcomes (DFID, 1999). However, classical economists' view of human capital refers only to the means of production. They argue that the productive output of a person partly depends on the rate of return on the human capital (Sen, 1997).

2.2.2.2: Social Capital

The term social capital has become increasingly popular over the last twenty years, especially in the economics and finance literatures (Guiso et a., 2004). Social capital is considered a broad concept. Putnam (2001) views social capital as the tendency of people in a society to cooperate in socially efficient outcomes. He argues that social capital is the complicated relationship between

a society and an individual that affects a person's behaviour as well as shapes his/her livelihood objectives. Connections, networks, groups and the nature of relationships are the essential elements of social capital. Relationships can either be vertical or horizontal across the wider society, and they also help people to gain faith and increase their ability to work together as well as extend their accessibility to wider institutions. Social capital is also important in creating a social safety net that works as an informal institution and helps poor people and vulnerable groups to manage shocks and stresses (Pretty, 1998; Pretty & Ward, 2001). According to Carney (1998), it includes the ability to request a relative or friend for any kind of help when needed or any kind of support from trade associations (for example farmers' or fishers' associations). The role of social capital is extremely important in natural resource management (Ostrom, 1990, Pretty & Smith, 2004). The combination of social and human capital is necessary for sustainable and equitable solutions to natural resource management problems (Pretty & Ward, 2001).

2.2.2.3: Natural Capital

Natural capital consists of natural resource stocks like soil, land, water, biological resources and environmental services like the hydrological cycle, pollution sinks, etc. (Krantz 2001). Ekins (2003) identifies that natural capital performs four types of environmental functions: i) source functions, ii) sink functions, iii) life support functions, and iv) human welfare functions. Natural capital is very important for those who are fully or partly dependent on natural resources for their livelihoods. Natural resource based activities include farming, fishing, gathering non-timber forest products and mineral extraction (DFID, 1999). Rural people are not only heavily dependent on natural resources, but also live in areas which are highly ecologically vulnerable and have low levels of resource productivity (Baumann, 2002). In regard to access to natural resources and to ownership issues, research revealed that indigenous people in different parts of the world are

strongly claiming their right to control their land, water and other resources as a basis for their livelihoods and local economy, their right to self-governance and representation of their own socio-political institutions (Colchester, 1994; Smith, 1999; Battiste & Henderson, 2000, cited in Berkes, 2008).

In the livelihood context, natural capital is closely associated with the term "vulnerability". Vulnerability in this context refers to the shocks, trends and seasonality that affect people's livelihood activities. Sometimes shocks can damage the natural capital base, and as a result disrupt the livelihood activities of the dependent households of a community (DFID, 1999).

2.2.2.4: Financial Capital: From the classical economists' perspective, financial capital are funds that are used to produce real capital and profit (Pearce, 1986). In the livelihood context, financial capital denotes the financial resources that people use to fulfill their livelihood objectives. This capital also includes flows and stocks of resources that can contribute directly to consumption and production (DFID, 1999). DFID (1999) suggests two main sources of financial capital. The first one is available stock, which means any capital that does not have liabilities attached to it, and usually does not entail reliance on others. This can be held in various forms like cash, bank deposits or liquid assets (e.g. livestock and jewellery). The second source of financial capital is regular inflows of money, which refers to any sources of income that are continuous and secure such as jobs or remittances.

2.2.2.5: Physical Capital: Generally, physical capital refers to the infrastructure of an area. Regarding the livelihood framework, physical capital is defined as infrastructure, equipment, housing and household goods. These physical assets are required for people to generate income and increase people's mobility and accessibility to wider markets, which helps them maximizing

their livelihood efforts. Various types of infrastructure, such as affordable transport, secured shelter, pure water supply and sanitation, clean and low-priced energy and access to information, are considered to be the bases of successful livelihoods (DFID, 1999). Many participatory poverty evaluation projects have found that inadequate access to a specific type of infrastructure is often considered the main reason for poverty, especially in rural communities. For example, inadequate access to water and energy causes deterioration of human health and much time is spent in unproductive activities such as collection of water and firewood. However, sufficient access to appropriate infrastructure can enhance livelihood productivity and reduce opportunity costs (DFID, 1999).

2.3: Expert vs. Stakeholders' Views on Management Approaches (in the context of participatory management)

2.3.1: Expert and Stakeholder Knowledge

In co-management contexts, the importance of both expert and non-expert knowledge is crucial in problem identification, framing and analysis. These are considered significant elements for social-ecological understanding, trust building and learning through which complementarities between formal, expert and stakeholder knowledge are acquired (Dale and Armitage, 2011). According to Barley & Kunda (2006), an expert is someone who gives certain information about a given topic and he/she should be referred to in its interpretation. Expert knowledge is substantive information on a particular subject that is not extensively known by others. Expert knowledge is extensively used in the practice of conservation and management due to the complicated nature of problems, limited resources to collect new practical data, as well as the imminent nature of some conservation decisions (Sutherland 2006; Kuhnert et al., 2010). The validity of expert knowledge

largely depends on scientific models and methods and on the quality checks of the peer review procedure (Irwin et al., 1999).

On the other hand, stakeholder knowledge is largely based on the experiences of stakeholders, or is associated with the particular context and location (Eshuis and Stuiver, 2005). This kind of knowledge is related to local experiences and local understanding and is intertwined strongly with the daily activities of local people. Stakeholder knowledge is developed from the experiences and practices in which people (i.e. inhabitants, entrepreneurs, etc.) are involved (Edelenbos et al., 2011).

Both stakeholder and expert knowledge exists in various forms. "Expert-knowledge generation is institutionalised and exclusive and shared through peer-reviewed processes, whereas lay knowledge is embedded in the world around and directly impacting on individuals " (Petts and Brooks, 2006; P: 1046). In addition, since experts generally strive for universal prescriptions in relation to the particular subjects, stakeholder knowledge is local and determined by the context (Petts and Brooks, 2006; Irwin et al., 1999)

2.3.2: Co-production of Knowledge and Bridging Organizations

Knowledge partnership is an essential element of successful co-management. Co-management is known to promote institutional linkages, both horizontally and vertically, and to facilitate local communities having a role in decision making (Berkes, 2009). In many cases of co-management, various actors need to think and work together and produce new knowledge from different sources, which is known as the co-production of knowledge. In describing the co-production of knowledge, Davidson-Hunt and O'Flaherty (2007, P: 293) argue that:

> Working from the premise that knowledge is a dynamic process – that knowledge is contingent upon being formed, validated and adapted to changing circumstances – opens up the possibility for researchers to establish relationships with indigenous peoples as co-producers of locally relevant knowledge.

In co-management, co-production of knowledge is accomplished by the collaboration of different types and sources of knowledge to address a defined problem and develop an integrated and system-oriented understanding of that problem (Dale and Armitage, 2011). Such co-production of knowledge along with social learning are crucially important for a wide range of areas, such as resource management, biodiversity conservation and adaptation (Berkes, 2012). Knowledge co-production is specially applicable in the context of social learning since it helps in the process of adapting to environmental changes (Laidler et al., 2009, Peloquin and Berkes, 2009). To produce and gather these new forms of knowledge, scientists as well as societal stakeholders and citizens are required to be closely engaged.

Bridging different organizations along with combining science and local knowledge assist in accelerating knowledge co-production, trust building, vertical and horizontal collaboration and conflict resolution. Though bridging organizations are considered similar to boundary organizations, they are believed to have a broader scope than boundary organizations (Hanh et al., 2006). Berkes (2009) argued that networking through bridging organizations helps build social capital, address conflicts, build trust and create a common vision, access needed resources and share common goals, as well as performing other tasks.

Bridging organizations are essential in co-management since they provide a complete package of services and promote other linkages. The absence of bridging organizations may result

in a co-management approach engaging various NGOs, government organizations, various research organizations, and other partners to fulfill various types of needs (Berkes, 2009).

Although many studies have been carried out on wetland resources in Bangladesh, research on flooded forest management and their impacts on the livelihoods of local communities has rarely been pursued. As a consequence, no systematic efforts have yet been made to examine flooded forest management practices, their resource use, livelihood security of local communities or the perspectives of local communities regarding community-based flooded forest management. This study intends to address this gap.

Chapter 3: Methodology

3.1: Introduction

This chapter describes the study area and explains the detailed methods applied in this study to address the research objectives. First, the chapter describes the philosophical approach behind the research process. In the second section, it explains the strategy of inquiry and rationale for using a case study approach. The third section provides a description of the study area. In section four, a detailed explanation of various PRA tools that were applied in data collection is provided. The fifth section describes the secondary data sources, and finally, an outline of data recording and analysis procedures is also provided.

In this research, a qualitative case study approach is used with the collection of quantitative and qualitative data. Qualitative research is used in examining and understanding the meaning that an individual or group ascribes to a human problem in a real-life setting. On the other hand, quantitative research is useful in examining and validating verified theories about how things happen, and providing numeric datasets which can be processed using statistical software (Creswell, 2009). For the purpose of this research, a qualitative research approach was therefore thought to be more appropriate.

3.2: Philosophical Approach

Research is always shaped by a philosophical position or a worldview. A worldview is known as "a general orientation about the world and the nature of research that a researcher holds" (Creswell, 2009; P: 6). In general, there are four major types of worldviews that guide social science research: i) postpositivism, ii) constructivism, iii) advocacy/participatory, and iv) pragmatism (Creswell, 2007).

The postpositivist worldview is known to be a deterministic and reductionist approach since it has limited application for understanding multidimensional issues. That is why this approach is not appropriate for understanding the voice of deprived and marginalized people (Creswell, 2007). Creswell (2007) suggests that social constructivism can overcome some of the limitations of postpositivism, by analyzing the complexity of an issue, but cannot reach far enough by recommending appropriate actions that can improve the lives of marginalized people. Heron and Reason (1997) also claim that the social constructivist paradigm lacks an identified epistemological role in its inquiry paradigm for experiential knowing.

The goal of my research was to examine the current state of people's livelihoods and capacity building in the context of reducing their dependency on flooded forests. My research follows the participatory approach rather than the postpositivist or constructionist approaches. The participatory approach, which is also known as the "community-based approach" (Minkler, 2005), is defined as a process that provides a voice for the marginalized participants and helps in improving people's lives by raising their consciousness or promoting an agenda (Creswell 2009). According to this approach, the aim of research is to make a change in the lives of participants as well as in the institutions they live and work with (Creswell, 2007). This approach allows for learning directly from local participants, in the field, face to face, and such learning is progressive with the opportunity for further exploration (Chambers, 1994).

3.3: Strategy of Inquiry: A Case Study Approach

A case study approach is particularly useful to apply when we need to gain an in-depth, multi-faceted understanding of a complex issue, event or a topic of interest, in a natural context. This is an established research approach that is applied by a wide variety of disciplines, especially within the social sciences (Crowe et al., 2011), as well in interdisciplinary studies. The case study

approach has strong merits since it not only engages qualitative techniques, but also integrates the quantitative and qualitative data of a case. It involves the thorough study of a single event or a case, but does not follow any particular data collection or data analysis methods (Yin, 2009). According to Denzin and Lincoln (2005), case studies are an "intrinsic study of a valued particular" that focuses on understanding the knowledge of people who have experienced a specific phenomenon. Yin (2014) stated that case studies are appropriate for answering questions with "why" and "how" by providing an in-depth understanding of the process.

For my research, I thought that a case study approach was most appropriate as I studied an issue within a specific, real-life natural context by using primarily "why" and "how" questions. I used the “single instrumental”, “descriptive” case study approach with exploratory elements (Yin, 2014), where I focused more on the issue rather than the case itself. Other approaches, like phenomenological research, ethnography, grounded theory, and narrative research, do not match very well with my research problem. Phenomenological research fits with problems where the researcher wants to understand the shared experience of people of a phenomenon; ethnographic approach works when the researcher is interested in understanding the beliefs, languages and behaviour of a particular cultural group; and grounded theory is applied when there is no available theory to explain a process.

3.4: A Brief Description of the Study Area

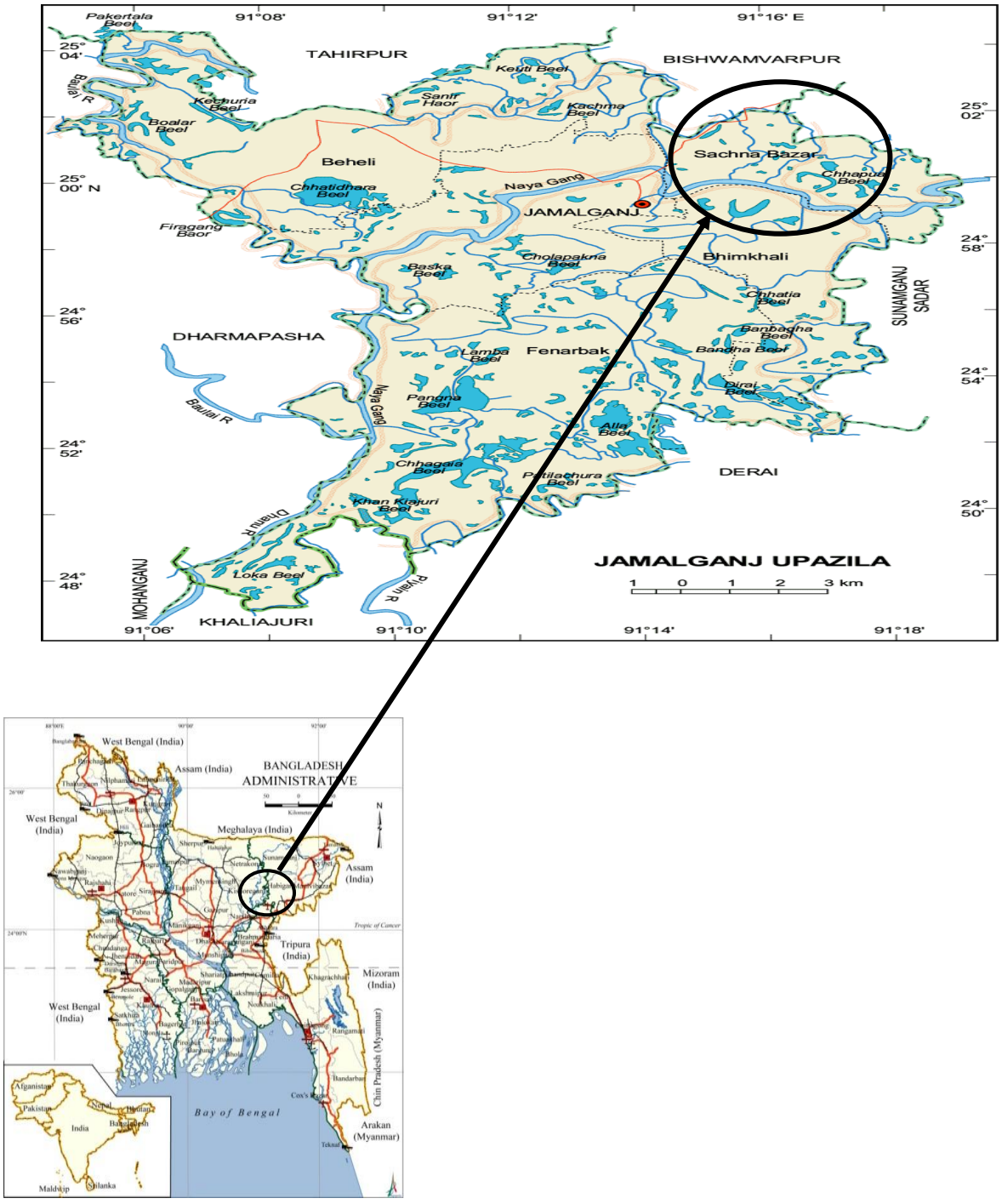
The research was carried out in the Rahimapur flooded forest area, located in the north-eastern region of Bangladesh. Administratively, Rahimapur flooded forest falls under Jamalganj (sub-district of Sunamganj) and is located at 24.9833° N and 91.2333°E. *Hijol (Barringtonia acutangula)* and *Koroch* (*Pongamia pinnata)* are the two dominant species of this forest, which covers two wetlands (locally called haor) named *Jumerkara* and *Chinmara*. Rahimapur forest was

a government-owned forested area and used to be leased out for several years until 2005. The area of this forest is 42.6 hectares, and people in seven adjacent villages (Rahimapur, Hariharpur, Gopalpur, Sholachura, Chinamara, Arshinagar and Rajapur) are dependent on the wetlands and forest resources. The study area of my research covers these seven villages (Figure 3.1) as I aim to understand their livelihood strategies as well as their perspectives towards the SFRS project and the community-based management approach being applied to the Rahimapur flooded forest.

Most of the original forest has been destroyed by the leaseholders and the adjacent community members due to the lack of management and/or mismanagement by the state (CNRS, 2009). The CNRS and AF undertook an initiative to support restoration and sustainable management of the flooded forests in the north-eastern wetlands of Bangladesh in 2009. Rahimapur flooded forest was included as part of this project. CNRS joined to support the goals and objectives of AF and took the responsibility to restore the semi-degraded patches of flooded forests in Jamalganj.

The project was implemented in two phases in Rahimapur flooded forest: the first phase encompassed 2009-2012, the second phase was an extension to 2014 and the third phase was terminated in September, 2017 (CNRS, 2015). A CBO was created with several members registered under the district cooperative department. The members of CBO were nurtured and trained throughout the project period so that they could continue restoration and management practices and could sustain their activities after the termination of the project. During the project, CNRS planted different species like *Jarul (Lagerstroemia speciose), Kalojam (Syzygium cumin), Raintree (Samanea saman), Koroi (Albizia procera),* etc. They also expanded *Murta (Schumannianthus dichotoma)* plantation at homesteads for enhancing alternative livelihoods.

Figure 3.1: Map of the study area



(source: wikimapia.org)

Murta can be used as raw material for making prayer mats and bed mats, *shitol pati* (a traditional bed mat made of *Schumannianthus dichotoma*), and it also reduces flood risk and soil erosion. In order to protect the remaining forest and to increase awareness about flooded forest conservation and management, CNRS organized 48 meetings with CBOs, communities, small women's groups, fishermen, boatmen, machine owners and livestock owners. Throughout these meetings, CNRS attempted to build up capacity and raise awareness in the local community to protect the flooded forests from various threats. CNRS intended to help the community to increase their family income by engaging them with AIG activities, such as homestead gardening, poultry and duck rearing, cow rearing, small village shops and homestead tree plantation (CNRS, 2011).

3.5: Data Collection Procedure: Use of PRA Tools

My research objectives required participation of community members in my data collection procedure so that they could share their knowledge and experience of CBRM with me. Therefore, I applied data collection techniques from participatory rural appraisal (PRA) tools, including participant observation, semi-structured interview (SSI), key informant interviews (KII), and Focus Group Discussions (FGD) (Pretty & Vodouhê , 1997). The data was collected over a period of four months from July to October, 2016.

Table 3.1: Methods and Tools Applied for Each Objective

Objectives	**Methods**	**Rationale**
1. To describe the SFRS project, its mechanism, and activities in linking natural resource conservation and livelihood security.	Participant observation	To understand how CBO as a team functions and how CNRS plays facilitating role
	FGDs	FGD with CBO members was helpful to learn about the activities of SFRS project; FGDs with local male and female members helped to learn about their engagement with project activities

	KIIs and SSIs	To understand communities' participation in project activities and their engagement in AIG and employment opportunities
2. To delineate how livelihood strategies and outcomes are affected by capital assets under the framework of SLA.	Household survey	To understand education level, economic condition and community's social engagement at household level
	KIIs and SSIs	To understand how community members utilize the AIG initiatives and training programs to manage their livelihood activities
3. To analyze views and perspectives of stakeholders on flooded forest management strategies and map the lessons learned from the SFRS project implementation.	Household survey	To understand communities' views and perspectives towards the project
	KIIs and SSIs	KIIs with CNRS and AF members and SSIs with local people helped to learn about their thoughts and understanding about SFRS project intervention and its activities
	FGDs	FGDs with local people were helpful to understand communities' problems in successfully adopting AIG activities

(Source: Ferdous, F. Rahimapur Forest Field Survey, 2016)

3.5.1: Participant Observation

Participant observation, the foundation of cultural anthropology, is based on getting close to people and make them comfortable so that the researcher can easily observe them and record information about their lives (Bernard, 2006). According to Mosse (2001), data collected in participant observation are generally descriptive and are gathered as photographs, notes, audio recording, and open ended interviews. Kawulich (2005) and Bernard (2006) noted that participant observation provides the scope of gathering an extensive variety of data that helps asking more sensible questions. According to Leedy and Ormord (2005), participant observations are helpful in

understanding community dynamics and organization as well as people's interactions with each other and with the environment.

During the field study, I gained important information by observing the people closely. Activities such as attending the monthly meetings of the CBO and CNRS, chatting with local people, walking through the village early in the morning and having engaged with local community people were all very insightful for my research. Participant observation allowed me to learn about local people's livelihoods, their way of living and communities' perceptions of community-based flooded forest management.

3.5.2: Semi-structured Interviews

Semi-structured interviews are known to focus on content and gradually evolve as a guided questionnaire. Since it is content-focused, Dunn (2005) suggests that researchers should develop a guided questionnaire first that is directly related to research questions. SSIs are able to adapt with the situation and changing circumstances. I conducted 40 SSIs focusing on the livelihood opportunities of local communities and their capacity building through the SFRS project (Appendix i).

3.5.3: Key Informant Interviews

Key informants are informed and experienced individuals who share their information and play a vital role in understanding culture (Gilchrist & Williams, 1999). They are interviewed intensively over an extended period of time with the purpose of having a complete description of the social and cultural patterns of the community. This method is suited for gathering qualitative and descriptive data that are time consuming and difficult to bring out through structured data gathering techniques (Tremblay, 2013). In my study, participants were identified from diverse stakeholders,

ranging from poor community members to the Deputy Commissioner of the district of Sunamganj, AF and CNRS officials, members of the CBO, senior citizens of the community, and individuals who are known as knowledgeable in the community.

Twenty-five KIIs were conducted by supplementing a semi-structured questionnaire (Appendix ii). This data collection procedure enabled me to understand livelihoods of the people, the motives and attitudes of community people regarding SFRS initiatives, their concern about managing the forest and community perspectives towards NGOs like CNRS.

3.5.4: Focus Group Discussion (FGD)

In qualitative research, a focus group is a group of individuals chosen and gathered by the researcher to discuss and share personal experiences on a selected topic. FGDs are able to represent guided and interactional discussion, and to generate "the rich details of complex experiences and the reasoning behind [an individual's] actions, beliefs, perceptions and attitudes" (Powell and Single, 1996; P: 499-500). According to Dunn (2005), this helps a researcher not only to learn the facts but also to understand the meaning behind the facts. It is also important for the researcher to redirect the conversation of the group if it moves too far from the actual topic. Generally, an FGD involves six to ten participants who belong to the same cultural and socio-economic backgrounds and share a similar experience or concern (Liamputtong, 2009).

Before organizing FGDs, I spent one month (i.e. July) with the communities conducting household surveys, SSIs and KIIs and engaging in informal chatting. It helped me to develop a sense of trust and intimacy with the community. I conducted five FGDs over last three months of my data collection in 2016 (Appendix iii). Taking the social norms into account, I separated the male and female non-CBO participants in FGDs. I was interested to experience different

perspectives and attitudes of CBO members and other community members towards CNRS as well as the SFRS project. I therefore avoided the mixing of CBO and non-CBO members in the same FGD forums.

Data in table 3.2 offer the details about the FGDs I conducted. The FGD with the CBO members was helpful to understand the initiatives CNRS undertook in the SFRS project since 2009, current state of it and their future plans. FGDs with different occupational groups helped in understanding communities' livelihood opportunities and their ability to manage social, physical and natural capital. FGDs with female members of the community were useful to experience the flooded forest from their point of view.

Table 3.2: Group composition, number of FGDs, place and duration of FGDs

Serial No.	Number of Partici-pants	Occupational Backgrounds	Number of FGDs	Length of FGDs	Date of FGDs	Place of FGDs
01	08	All were CBO members of SFRS project	1	2 hours	17 August, 2016	Rahimapur Village
02	06	All were housewives	1	45 Minutes	25 September, 2016	Rajapur Village
03	06	All were housewives	1	1 hour	27 August, 2016	Arshinagar Village
04	07	Participants include farmers, fishers, carpenters and day labors	1	1 hour	10 October, 2016	Rajapur Village
05	07	Participants include farmers, fishers, carpenters and day labors	1	50 minutes	19 October, 2016	Gopalpur Village

(Source: Ferdous, F. Rahimapur Forest Field Survey, July-October, 2016)

3.5.5: Household Survey

Though my research followed predominantly a qualitative research approach, it was further supplemented by some quantitative data, i.e. from a household survey. The main reason for conducting a household survey was to know about livelihood characteristics and to have a precise socio-demographic picture of the local people. Moreover, local people's personal attachment to the forest and their perspectives towards the SFRS project were also brought out through the household survey. I conducted 70 household surveys in seven villages (Appendix iv). To examine women's engagement, I conducted 100 household surveys in these seven villages. The number of people surveyed in each village are shown in Table 3.3.

Table 3.3: Numbers of households surveyed from each of the selected villages

Serial No.	Name of the villages	Number of households surveyed
1	Rahimapur	10
2	Hariharpur	10
3	Gopalpur	10
4	Sholachura	10
5	Chinamara	10
6	Rajapur	10
7	Arshinagar	10
Total		**70**

(Source: Ferdous, F. Rahimapur Forest Field Survey, July-October, 2016)

3.6: Secondary Data Sources: CNRS Reports

In addition to the above sources, I also collected data from secondary sources. Secondary sources consisted of government reports, literature on wetlands and wetland communities in Bangladesh,

CNRS yearly evaluation reports, and a number of other NGO reports on different wetland management projects. These reports were collected from government departments, CNRS, AF, and local lease holders. The secondary data sources helped me understand the current state of the SFRS project, the history of wetland management and other wetland management issues.

Table 3.4: Major events of field research spread over a period of four months

Method	**Number**	**Government/NGO members**	**Local stakeholders**	**Period/Time of Data collection**
Key Informant Interviews	25	CNRS members: **3**	CBO members (male): **5**	July-October, 2016
		AF member: **1**	CBO members (female): **2**	
		DC (Sunamganj): **1**	Local members: **12**	
		Leaseholder: **1**		
Semi-Structured Interviews	40		Local community members: **40**	July-October, 2016
Focus-Group Discussions	5		CBO members: **1**	17 August
			Community members (female): **2**	25 September 27 August
			Community members (male): **2**	10 October 19 October
Household Surveys	70		Local community members: **70**	July-October, 2016

Household Surveys (Women's engagement)	100		Local community members: **100**	July-October, 2016

(Source: Ferdous, F. Rahimapur Forest Field Survey, July-October, 2016)

3.7: Techniques for Data Recording and Analysis

All KIIs, SSIs and FGDs were recorded with an audio voice recorder, with the informed consent of all the interviewees. All the interviews with the community members, government and NGO officials and the Deputy Commissioner of Sunamganj were conducted in the Bengali language. The pictures were taken with a digital camera after receiving consent from the respondents and other members of the studied communities.

The interviews were first transcribed using exactly the same words. Then data were coded to discover the underlying themes. A paper-based data coding process instead of a computer assisted data coding process was used. A set of *a priori* themes were selected, which also helped coding the text. SPSS software was used to analyze the data collected from the household survey.

3.8: Ethical Considerations

My research was within a qualitative research paradigm and employed a case study strategy of inquiry following a participatory approach. Therefore, participants' involvement was required in every stage of my data collection process. I received approval on June 24, 2016 from the Joint-Faculty Research Ethics Board to conduct the research. Following the methods explained above, I conducted my thesis field research investigation from July, 2016 to October, 2016. The field

research was conducted by taking participants' verbal and written consent. Audio recording for KIIs, focus group discussions, and household surveys were done after making them aware of the data collection procedure. A copy of the approval letter from the ethics board is attached in Appendix vi.

Chapter 4: Swamp Forest Restoration in Sunamganj (SFRS) Project, Stakeholder Mobilization and Implementation

4.1: Introduction

This chapter focuses on the first objective of my thesis: to outline the SFRS project, its mechanism and activities in linking natural resource conservation and livelihood security. This chapter starts with a detailed background of the Rahimapur forest and the livelihood opportunities of communities during the pre-SFRS project period. I discuss SFRS project, its specific objectives and the system and strategies followed in achieving these objectives. As well, this chapter explains the stakeholder selection procedure of the project, and how the stakeholders were mobilized through various project activities in order to ensure conservation of the flooded forest and livelihood security. This chapter also discusses the actions performed by the CBO of Rahimapur forest in accomplishing SFRS project goals and objectives.

4.2: Livelihood Opportunities of Villagers During the pre- SFRS Project Period (Before 2009)

In the project area, people from different occupational backgrounds make their livelihood, including: fishermen, farmers, carpenters, day labors, vegetable and wild food collectors and firewood collectors. These communities were dependent on wetlands and flooded forest resources for direct and indirect benefits. During the wet season (March-August), the entire area becomes inundated with flood water. It is reported by the villagers that they use the adjacent wetlands mostly for fishing during this high-water period. In the wet season, both fishers and non-fishers rely on fishing since the options for AIG sources are limited. The villagers explained that the non-fisher villagers have access only to the lease-free areas where fish is scanty compared with the resourceful *beels* (perennial water bodies) that were always under the control of lease holders.

The conditions of these areas are completely different during the dry season (September-February), when water concentrates and becomes confined to the small *beels*. The *beels* that could contain water during dry and wet seasons are leased out to the lease holders. Apart from fishing, agriculture is also widely practiced during dry seasons. There are mainly three main types of farmers in the project area: i) large farmers who have agricultural lands of their own, ii) small farmers who lease land from others to grow crops, and iii) the farmers who use homestead land for agricultural purpose. Besides these activities, marginalized people used to collect firewood and leaves from the forest to sell or for cooking purposes. Since the flooded forest was leased out by the government, villagers did not have the required permission to use any resources from the forest. However, the poor villagers often engaged themselves in illegal activities in the forest, including illegal cutting and selling of trees, cutting tree branches for fuel wood, extracting other forest resources and grazing cattle. Although they were getting benefits from the forest illegally, they did not have guaranteed access to the forest resources. It was reported by the community that the poor villagers often became victims of violence by legal lease holders and/or were harassed by government administrative authorities.

4.3: SFRS Project in Rahimapur Forest

In 2009, CNRS and AF, two environmental NGOs, started the SFRS project with a view to ensure sustainable conservation of flooded forests in the north-eastern region of Bangladesh through successful participation with and development of livelihoods of local communities. CNRS took the initiative to implement this project with the financial and technical support from AF. The project was initiated to conserve and restore the degraded flooded forest and other degraded sites in two sub-districts of Sunamganj (AF, 2014). The project operates in two flooded forest of Sunamganj, namely Gobindopur flooded forest and Rahimapur forest. The area of Rahimapur

forest is 44.36 hectares, which was leased by CNRS from the Deputy Commissioner of Sunamganj in 2009, for a 10 year period. The project area, which covers the Rahimapur forest and adjacent seven villages (Rahimapur, Hariharpur, Arshinagar, Rajapur, Gopalpur, Chinamara and Sholachura), was selected as the study area for the present research. CNRS and AF have completed two phases of the SFRS project (first phase 2009 to 2012; second phase 2012 to 2014) and was in an extension phase during the present study (CNRS, 2015). CNRS has been performing the overall administrative responsibilities to implement the SFRS project activities.

Participatory management has been the foundation of the SFRS project, which was developed with the belief that a change from top-down management to an approach of sharing decisions and responsibilities between local forest users and forest managers (i.e. CNRS and AF). It was expected that such an approach would improve the quality of decisions and ensure local acceptance of the project. Therefore, the intention of the SFRS project was to engage the local resource users to actively participate in the project activities with the expectation of better forest management. The SFRS project initiated two major initiatives for engaging community members with the project. The first one was to engage local community members in plantation activities in both the forest area and at the homestead level. The second one was to provide AIG activities to community members, build their capacity and raise awareness regarding the flooded forest.

Some key details of SFRS project are:

- Project Title: Swamp Forest Restoration in Sunamgonj (SFRS)
- Funding Agency: Arannayk Foundation
- Implementing Organization: Center for Natural Resource Studies (CNRS)
- Project Duration of Phase 1: 2009 to 2012
- Project Duration of Phase 2: 2012 to 2014
- Project Extension Phase: 2015 to July, 2017

The specific objectives of SFRS project were, as per the CNRS (2012) Report:

- To promote community-based restoration and management of flooded forests in the haor basin.
- To regenerate awareness and build capacity of communities including relevant stakeholders on the protection and conservation of flooded forests for the healthy nature and sustainable livelihoods.
- To influence national policy, process and structures in favor of restoration and protection of flooded forests and conservation of biodiversity.

The focus of the project was to ensure sustainable conservation and management of Rahimapur forest by confirming effective participation and development of the livelihoods of poorer sections of the communities. It order to secure both forest conservation and livelihood development in the project area, it was crucial to increase awareness and build the capacity of community members by engaging them in the project activities. The first two objectives of the SFRS project highlighted conservation and management of Rahimapur forest as well as development of sustainable livelihoods for local communities. A brief overview of the activities taken under the first two objectives of the SFRS Project is provided in Table 4.1.

Table 4.1: Strategies followed by CNRS for Objective 1 and Objective 2 of the SFRS Project (during Phase I, Phase II and extension phases)

Steps	Objective 1	Objective 2
Step 1	The goals, objectives and possible activities of the SFRS project were shared by CNRS with the local government, land owners and other community members.	CNRS conducted several meetings with community members of different occupations to make them aware about the importance of flooded forest resources.
Step 2	CNRS organized 48 meetings with the community people of project site and discussed the overall situation of the Rahimapur forest, communities' dependency	CNRS formed a CBO of 36 members from the project area with responsibility to work for forest conservation and

	on the forest resources, the impact of forest degradation on local people.	management. 11 members from the CBO form an executive committee.
Step 3	CNRS took lease of 44.36 hectares of land from the Deputy Commissioner, Sunamganj, on a 10 year lease and also selected the adjacent seven villages under the project area.	CNRS organized meetings with CBO members to discuss several forest management issues.
Step 4	CNRS conducted a household survey in the project area and selected beneficiaries according to the information of their number of households, literacy, occupation, dependency on forest resources etc.	Training programs were organized for CBO members and other project beneficiaries on vegetable gardening and seeds and seedlings of several vegetables.
Step 5	CNRS collected information on the existing trees of Rahimapur forest.	Seven training programs were arranged on organizational and leadership development, forest conservation and management, planning and organizational capacity development for CBO and other participants.
Step 6	CNRS formed a Project Implementation Committee (PIC) and involved them in forest plantation.	CBO members were trained on account management and fund utilization.
Step 7	CNRS, with the assistance of the PIC, planted two major species *Barringtonia acutangula* and *Pongmia pinnata* in Rahimapur forest.	Improved cook stoves were distributed at a reduced price to the poor families. The project beneficiaries were also provided with several fast growing species to use as firewood.
Step 8	The project initiated planting *Murta* (*Schumannianthus dichotoma*) and Cane (*Calamus spp*) and a few new species at	CNRS initiated several activities – folk songs, celebrating special days (for example World Forestry Day, World Environment Day), red flag alert, etc. to

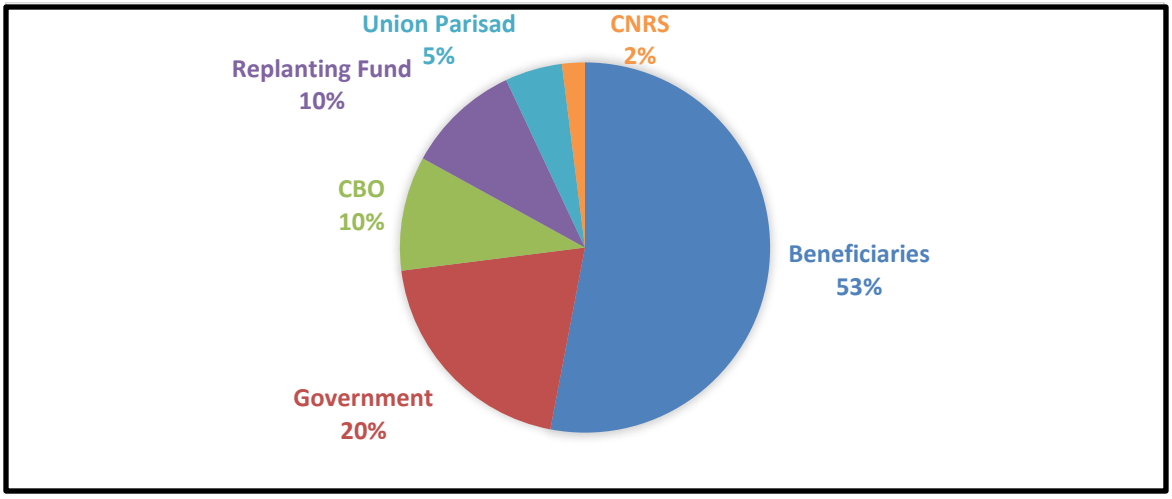
	Rahimapur forest and later further extended at the homestead level.	raise awareness among community members.

(Source: CNRS, 2013)

4.3.1: Benefit Sharing Mechanism of SFRS Project

The benefit sharing approach had a crucial role in motivating community members and ensuring their participation in forest management. The Government of Bangladesh's 1994 forest policy has developed community benefit sharing rights to forest management activities. As a consequence, the benefit sharing process among different stakeholders in participatory management was established in the Social Forestry Rules of 2004. These clear benefit sharing rights have gradually ensured local people's involvement in participatory forest management (Islam, 2011). The SFRS project also followed the benefit sharing mechanism developed by the Social Forestry Rules of 2004. According to this agreement the community would have the right to use this land for 10 years. When the leasing period of Rahimapur forest will finish in 2019, the trees will be harvested following a systematic harvesting mechanism and the profit will be shared among all the stakeholders. They will include project beneficiaries, the CBO, CNRS, *Union parishad* and the government. The benefit sharing percentage will be: beneficiaries 53%, government 20%, CBO 10%, replanting fund 10%, *Union Parisad* 5% and CNRS 2% (CNRS, 2012) (see Figure 4.1).

Figure 4.1: Benefit sharing mechanism of SFRS project



(Source: CNRS, 2012)

4.3.2: Stakeholder Analysis and Selection of Stakeholders by SFRS Project

Stakeholder engagement is generally considered a significant aspect of international development projects, in which significant attention is given to identifying those who will be affected by a project and making them participate actively in the project's design and delivery with a view to ensuring that the project is sensitive and flexible to local needs and conditions (World Bank, 1996). According to Ramirez (1999), the term "stakeholder" was first used during the 17th century in order to describe a third party entrusted with the stakes of a bet. In some theories, stakeholders are defined in a narrower and instrumental way as individuals or groups "without whose support the organisation would cease to exist" (Bowie, 1988; P: 112), whereas other definitions propose this in a wider and more normative way where "any naturally occurring entity that is affected by organisational performance" is considered a stakeholder (Hubacek and Mauerhofer, 2008). It is therefore crucial to identify the individuals, groups and the organizations who have a stake in the program. Stakeholder analysis "is an approach and procedure for gaining an understanding of a system by means of identifying the key actors or stakeholders in the system, and assessing their interest in that system" (Grimble, 1995; P: 114). This process is used to identify individuals, groups

and organizations who can affect and be affected by the policies, decisions and actions of the system (Reed et al., 2009).

In the context of natural resource management, the overall objective of stakeholder analysis is to develop our understanding in order to design better projects and policies for natural resource management. In this field, stakeholder analysis emphasizes developing a clear understanding of power dynamics and ensuring fairness and transparency of decision making in development projects. To achieve this, it is important to recognize actual stakeholder groups and identify their various sets of objectives, interests and circumstances; all of these should be considered in the development and conservation planning of natural resource management (Grimble, 1995). It is also used to empower marginal groups like women, the under-privileged or socially disadvantaged groups, or those who are not easily accessible, for instance communities far from main roads (Johnson et al., 2004).

The SFRS project aimed to understand and predict which households were dependent on the forest resources and how this affected Rahimapur forest's health and sustainability. Within this, stakeholder analysis was applied in order to identify individuals and groups with an interest in and influence over Rahimapur forest in order to engage them with project activities. Stakeholders (they are called "project beneficiaries" by the SFRS project) were initially identified by CNRS members through different community consultations, meetings and focus group discussions. Classification of the wealth (rich, middle class, poor and extreme poor) of all the villagers of the project site was made as per the Social Forestry Rules, 2004. Importance was given to people from poor households, generally those owning under 0.2 ha of land, and those having a low education level, laboring as a migrant worker for part of the year and households that have no connection to any other NGOs. These households were mostly from villages close to Rahimapur

forest and were directly or partly dependent on forest resources before the inception of SFRS project. Special emphasis was given to the poor members of the community who were heavily dependent on forest resources, to ensure that they constituted a major section of beneficiaries and could have the strongest possible voice. After identification of the initial set of beneficiaries, all were verified by community members by questioning the beneficiaries as to whom they perceived the main beneficiaries to be. Finally, a total of 200 beneficiaries were selected from seven villages, guided by local community people's opinions and concerns (CNRS, 2013). They were subsequently mobilized by CNRS members through participating in: forest management activities in collaboration with the CBO, alternative income generating (AIG) activities, and different capacity and awareness building sessions and workshops on livelihood management and resources conservation measures.

4.4: Stakeholder Mobilization by SFRS Project through Project Activities

Under the partnership agreement between AF and CNRS, the latter was responsible for stakeholder mobilization and for developing the co-management approach in the project area. During the project period from 2009 to 2016 (including Phase 1, Phase 2 and the extension phase), CNRS performed the activities described below in sections 4.4.1 to 4.4.4 to achieve the goal and objectives of the project. Since the management of the project was based on a participatory approach, various forest conservation and livelihood improvement activities were organized with active participation of all the stakeholders including CNRS, CBO members and 200 beneficiaries from the project area. Among these beneficiaries, the number of male headed families were 187 and the rest were female headed families. Most of the beneficiaries were farmers, while some had other means of livelihood, including fishing, small business, owners of small shops and drivers (CNRS, 2015).

To ensure an adequate representation of all the stakeholders' interests, the SFRS project executed a series of activities including forest conservation, homestead plantation, vegetable gardening, providing AIG and employment opportunities as well as capacity and awareness building programs. The process of engaging the communities with such initiatives and developing their management capacities made the participants efficient and capable of overcoming livelihood related problems and implementing various types of income-generating activities. In addition, CNRS and CBO members mediated and supervised all the beneficiaries to ensure their participation was in line with the objectives of the project. These actions of CNRS and CBO members were consistent with the operational standard of participatory projects since it required that "there should be a project coordinator or planner to see that the agreed participatory trajectory of a project is strictly adhered to" (Papineau & Kiely,1996 cited in Usadolo, & Caldwel, 2016; P:6). For example, I observed that CNRS representatives were closely involved with the CBO members in the implementation of the project.

Such collaborative relationships offered the beneficiaries open access to all the stakeholders, including AF and CNRS representatives, CBO members and agriculture extension officers, since the beneficiaries were the center of all the development and conservation activities of the project. The KIIs, SSIs and FGDs revealed that the beneficiaries welcomed the participatory relationship of the SFRS project. One of the beneficiaries' commented, which is in agreement with the general views of others, as follows:

> "All the beneficiaries are treated equally by the CNRS representatives. Even though we need to be guided through all the project activities, we work together with the government people (i.e. AF and CNRS representatives). We were made to understand that the issue of forest conservation and management is not only for government but also for us. They take

our suggestions and it is nice to see government people when there are challenges. In fact, we are all the same and we all learn together!"

Participatory relationships were encouraged to promote mutual understanding (Usadolo, & Caldwel, 2016). The beneficiaries stated that their access to CNRS representatives was always open and all the stakeholders were comfortable with each other. According to the beneficiaries, such unfettered access to all the stakeholders had a positive impact on the participatory process of the project and they could talk to the CNRS representatives more candidly with a sense of cohesion, which had helped them to participate in various project activities. The process of engagement through such activities by the community stakeholders is illustrated in the following sub-sections.

4.4.1: Tree Plantation and Conservation and Management of Rahimapur Forest

Tree plantation for restoration and conservation of Rahimapur forest were some of the SFRS project's key interventions. The first step in conserving the flooded forest was intensive community consultation to identify, together with the community members, the threats to the flooded forest and develop a consensus on solutions in the form of a participatory action plans. The second step was establishing an institutional framework for communities as well as the project for conserving and managing the Rahimapur forest resources. Hence, two types of new organizations were created at the project area, namely the CBO and project implementation committee (PIC). The CBO was formed to assist CNRS members in planning, designing and implementing SFRS project activities (detailed activities of the CBO are discussed in section 4.5). However, the PIC was formed only for accomplishing afforestation programs in the project area. The members of the CBO were selected by CNRS members following criteria like the extent of dependency on forest resources, economic condition, education and occupation, in order to ensure

the active participation of poor households in forest resources management processes. The CBO selected PIC members from the members of the community by considering their capability, honesty and interest in volunteering. PIC members were responsible for the procurement of plantation activities in the forest area during SFRS phases I and II. The intention of engaging local participants in plantation activities was to build a sense of ownership of the forest among them, as well as to ensure better forest management. Thus, co-management has been promoted in the project area with the belief that sharing decisions and responsibility between resource users and project managers (i.e. CNRS) would improve the quality of decisions and local compliance with forest management plans.

Figure 4.2: Local community members working in plantation program of SFRS project

(Source: CNRS, 2014)

4.4.1.1: Plantation of Major Flooded Species in Rahimapur Forest

During the first phases of the SFRS project, PIC members, under the supervision of CNRS and the CBO, accomplished the plantation of two major species, *Koroch* (*Pongamia pinnata*) and *Hijol* (*Barringtonia acutangula*), at the semi-degraded Rahimapur forest, and brought 12.55 hectares of

lands under plantation following a standardized plantation process. A total of 20,695 saplings of these two species were planted under the program by the end of first phase, in which the number of *Koroch* (*Pongamia pinnata*) and *Hijol* (*Barringtonia acutangula*) sapling was 18,668 and 2,027, respectively. During the second phase of the project, CBO, PIC and CNRS members decided to undertake gap filling of the existing plantation and planted 2,725 saplings of *Koroch* (*Pongamia pinnata*) and *Hijol* (*Barringtonia acutangula*) and added 1.25 hectares to the lands under plantation. Throughout the phases, various other flooded species have also been included in the project site, such as *Raintre*e (*Samanea saman*), *Kodom* (*Neolamarckia cadamba*) and *Arjun* (*Terminalia arjuna*). Data presented in Table 4.2 indicate that 600 saplings of these three species were planted at Rahimapur forest, of which 492 survived, showing a survival rate of 82%. A major section of the forest was covered with afforestation during the first phase of the project, with 13,868 saplings followed by 4,027, 2,000 and 800 saplings in the following years of 2010, 2011 and 2012 respectively (CNRS, 2013).

Table 4.2: Saplings planted at Rahimapur Forest during Phases I and II

Serial No.	Name of species	Total planted Saplings	No. of Survived Saplings	Survival rate (%)
1	*Jarul (Lagerstroemia speciosa)*	300	268	87.33
2	*Raintree (Samanea saman)*	100	78	78
3	*Arjun (Terminalia arjuna)*	200	156	78
	Total	**600**	**492**	**82**

(Source: CNRS, 2013)

4.4.1.2: Conservation of Different Species at the Homestead Level

The SFRS project not only introduced new species to Rahimapur forest, but also initiated several species at the homestead level. The female members of the community were encouraged to conserve the existing naturally grown cane (*Calamus sp.*) stands in Rahimapur forest and further extend cane cultivation at the homestead level. CNRS and CBO members arranged several meetings with women's groups and discussed the importance of planting economically and medicinally valuable plants, like *Arjun* (*Terminalia arjuna*), *Basak* (*Justicia adhatoda*) and *Chikrashi* (*Chukrasia tabularis*) at the homestead level. A total of 9,215 saplings of different species were planted at Rahimapur forest and the homestead level, in which the number of *Murta* (*Schumannianthus dichotoma*), *Basak* (*Justicia adhatoda*), *Eucalyptus* (*Eucalyptus globulus*) and *Chikrashi* (*Chukrasia tabularis*) were 2,035, 4,600, 1,000 and 400 respectively (Table 4.3). Among 9,215 saplings, 5,549 survived, giving an overall survival rate of 61.40% at the project site. Detailed information of planted saplings in Rahimapur forest and homesteads is given in Table 4.3.

Table 4.3: Information of planted saplings at homestead level

Name of Species	**No. of planted saplings**	**No. of survived saplings**	**Survival rate (%)**
Kodom (Neolamarckia cadamba)	325	316	95.33
Arjun (Terminalia arjuna)	395	364	93.03
Murta (*Schumannianthus dichotoma)*	2,035	2,003	95.32
Raintree (*Samanea saman)*	210	196	85.36

Bashok Pata (*Justicia adhatoda*)	4,600	1,091	25.00
Chikrashi (*Chukrasia tabularis*)	400	329	80.40
Mango (*Mangifera spp*)	250	250	100.00
Eucalyptus (Eucalyptus globulus)	1,000	1,000	100.00
Total	9,215	5,549	61.40

(Source: CNRS, 2014)

4.4.2: Capacity-building Activities for Project Beneficiaries

The primary goal of the SFRS project was to promote the conservation of biodiversity in Rahimapur forest. In addition, one of the project's key objectives was to "build capacity of communities including relevant stakeholders on the protection and conservation of flooded forests for the healthy nature and sustainable livelihoods" (CNRS, 2013; P:2). To achieve this goal, a large section of the beneficiaries were trained through several sets of courses on flooded forest management and other livelihood improvement activities. These courses covered flooded forest management, vegetable gardening, nursery development and grafting techniques, seed preservation, seedling production and sapling management. Based on this training, the project beneficiaries were able to enhance skills and knowledge that helped them in managing their livelihoods, maintaining savings and credit and overcoming barriers within the group that affected their activities adversely.

4.4.2.1: Training in Vegetable Cultivation

Conservation efforts of a participatory management project succeed only when the local communities who depend on forest resources perceive more value in conserving than exploiting

them. Skill-development training and involvement in participatory management activities help community members to alleviate their reliance on forests (Subhani, 2008). Keeping these ideas in mind, CNRS engaged project beneficiaries in training sessions on vegetable gardening to promote vegetable cultivation as a sustainable income generating option to increase their family income. Almost 50% of the project beneficiaries received training on vegetable cultivation in seven sessions, in which most of the participants were female members of the beneficiary households (CNRS, 2013).

4.4.2.2: Training in Tree Grafting

In general, one of the main occupations of household heads in the project area is farming (about 30%). The SFRS project supported farmers to learn new techniques that will be beneficial for their occupation. The project played a key role in building the capacity of farmers by providing training on a variety of topics, such as side veneer grafting, splice grafting and bridge grafting techniques. A total number of 18 participants attended these grafting training programs. CNRS project members, along with the Sub-district Agriculture Officer and Sub Assistant Agriculture Officer of Sunamgonj, arranged two training sessions for farmers on grafting of fruit trees (e.g., mango and Indian plum) (CNRS, 2013).

Moreover, training programs were arranged on flooded forest management, sustainable conservation and systematic harvesting of forest resources, seedling production, sapling and tree nursery management. Detailed information about training and advocacy provided by CNRS in the SFRS project is shown in Table 4.4.

Table 4.4: Training and Advocacy provided by CNRS

Serial No.	Name of Training	No. of training sessions	No. of participants
1	Flooded forest management	2	62
2	Vegetable gardening	7	110
3	Nursery entrepreneurship, development and grafting techniques	1	10
4	Farmers/staff training on grafting techniques, seed preservation, seedling production and sapling and nursery management	2	18
5	Training on sustainable management, conservation and systematic harvesting processes	1	18
6	Training on accounts keeping for the CBO leader and project beneficiaries	1	28

(Source: CNRS, 2013)

4.4.3: Alternative Income Generating (AIG) Sources for Poor, Forest-Dependent Users

Providing AIG opportunities to the local people in order to promote their social and economic improvement is considered one of the most important aspects of a co-management approach (Rashid et al., 2013). The incentives of AIG activities inspired the poor community members to actively participate in the SFRS project by offering them enough income that reduced their dependency on forest resources sufficiently to let the resources recover. AIG activities in improving rural livelihoods were the key factors in mitigating the possible impacts of reducing dependency on flooded forest resources, and in reducing wetland encroachment and improving wetland ecology (Kabumbuli and Kiwazi 2009).

Realizing that limiting access to forest resources would be an additional burden on forest resource users, the SFRS project identified and developed AIG opportunities for project beneficiaries and others directly dependent on forest resources, especially for poorer users. More than 500 forest resource users in the project area joined in AIG activities (CNRS, 2013). A number of activities were introduced by the SFRS project focused on various types of trades that provided AIG activities to farmers and fishers. The general AIG activities included poultry/duck rearing, vegetable cultivation, small-scale trading, and individual skilled work, such as operating a tree nursery. The project also engaged the beneficiaries in other AIG activities, such as the plantation of *Murta* (*Schumannianthus dichotoma*) and other medicinally and economically important plants at the homestead level. The recipient members of AIG sources were also trained in various skills so that they could use them in managing livelihood challenges. Though they initially faced some problems due to a lack of skills, training and capacity building on specific activities helped them to overcome these difficulties. To reduce their dependency on the forest for firewood, women in the project area were provided with improved cook stoves (ICS) as well as saplings of fast growing species like *Akashmoni* (*Acacia auriculiformis*) and *Ipil ipil* (*Leucaena leucocephala*). A number of beneficiaries were employed as forest guards in order to protect the forest from illegal logging, animal grazing and firewood collection. These initiatives aided the community members in taking up new occupations and earning income from non-flooded forest resources that created employment opportunities for them.

4.4.3.1: Seed and Seedling Distribution of Vegetables and other Fast-Growing Species

The project beneficiaries were encouraged to start vegetable gardening on homestead land and adjacent fallow land (CNRS, 2013). In order to encourage community people in homestead vegetable gardening, CNRS distributed various types of vegetable seeds among all the project

beneficiaries at different times of the project period, including bottle gourd, radish, cowpeas, bean, sweet gourd and Indian spinach. Apart from vegetable seeds, beneficiaries were also provided several fast-growing species like *Akashmoni* (*Acacia auriculiformis*) and *Ipil ipil* (*Leucaena leucocephala*) to plant on homesteads. *Akashmoni* (*Acacia auriculiformis*) provides a major source of firewood and *Ipil ipil* (*Leucaena leucocephala*) has dual economic value for both wood and cattle fodder (CNRS, 2014).

4.4.3.2: Expansion of Murta (Schumannianthus dichotoma) Plantation on Homesteads

Murta (*Schumannianthus dichotoma*) is a widely grown species in wetland areas of Bangladesh. The SFRS project engaged the local community in extending *Murta* (*Schumannianthus dichotoma*) plantation on homesteads to create alternative livelihoods for them. In 2011, eight CBO members from three villages were motivated to plant this species on their homesteads and other fallow land. They planted 235 saplings of this species; the survival rate of this species was 100% (Table 4.5). This is used by the beneficiaries as raw material for making prayer and bed mats such as *shitol pati* (a traditional bed mat). The inexpensive cultivation of *Murta* (*Schumannianthus dichotoma*) does not conflict with the production of other agricultural crops. Cultivation of this species along roads, canals, ponds, around homesteads, and on fallow lands can reduce soil erosion and minimize flood risk (CNRS, 2013).

Table 4.5: Plantation information of *Murta (Schumannianthus dichotoma)*

Serial No.	Name of village	No. of CBO members	No. of saplings planted	Survival rate (%)
1	Sholachura	01	35	100
2	Arshinagar	04	110	100
3	Rajapur	03	90	100
	Total	08	235	100

(Source: CNRS, 2013)

4.4.3.3: Introducing Economically and Medicinally Important Plants at the Homestead Level

During the period 2011-12, the SFRS project introduced a few new species to the project site including *Arjun* (*Terminalia arjuna*), *Basak* (*Justicia adhatoda*) and *Chikrashi* (*Chukrasia tabularis*), which are widely known for their economic and medicinal value. Saplings of these three species were distributed among all the project beneficiaries to plant beside their homestead. A total of 5,200 saplings were distributed, in which the number of *Arjun* (*Terminalia arjuna*), *Basak* (*Justicia adhatoda*) and *Chikrashi* (*Chukrasia tabularis*) was 200, 4,600 and 400 respectively (Table 4.6). In 2012, it was found that the number of surviving saplings was 1,412 and the survival rate was 27.15%. The survival rate of *Arjun* (*Terminalia arjuna*) (85%) and *Chikrashi* (*Chukrasia tabularis*) (82.25%) was significantly higher than *Basak* (*Justicia adhatoda*) (19.85%).

Table 4.6: Plantation information of introduced species

Name of Species	No. of saplings planted	No. of surviving trees (by 2012)	Percentage of surviving trees (by 2012)
Arjun (*Terminalia arjuna*)	200	170	85%
Chikrashi (*Chukrasia tabularis*)	400	329	82.25%
Basak (*Justicia adhatoda*)	4,600	913	19.85%
Total	5,200	1,412	27.15%

(Source: CNRS, 2012)

4.4.3.4: Distribution of Improved Cook Stove (ICS)

With the aim of reducing the dependency of local communities on flooded forests for firewood collection, the SFRS project distributed ICSs to the beneficiaries, which was designed to prevent the wasteful consumption of fuel. CNRS and CBO members targeted the poor beneficiaries, mostly from the villages very close to the forest. A total of 40 poor households were identified from the project beneficiaries to provide ICSs at a cheaper price. Of them, around 59% came from households in which household heads work as immigrant workers outside the villages, and the female members were in charge of the family responsibilities. The women who received ICSs commented that the use of ICS helped to save fuel wood and their houses remained clean with no smoke. Though the regular price of each stove was $14.16 (850 BDT) in the market, the SFRS project provided these stove to them only for $5.83 (350 BDT) (CNRS, 2013).

4.4.3.5: Providing Facilities for Nursery Plantation

In 2013, a training program on nursery development and management was initiated at the project site to help the beneficiaries acquire knowledge on producing wooden, fruit and medicinal seedlings, and making an earning out of it. Technical and managerial training on nursery development and management, growing and planting seedlings, and maintenance of plantations was provided by the project. CNRS, along with the CBO, selected 10 members from the beneficiaries to provide training on nursery development. After the training, one of them was interested in making this his main occupation. Hence, CNRS managed to provide financial support of BDT 10,000 through a CBO account as a loan. This fund was distributed to the nursery entrepreneur by signing a tri-party agreement. A nursery fund utilization guideline was made by CNRS for the nursery entrepreneur, the CBO and project staff to maintain the transparency and accountability of this system. However, all the beneficiaries did not get an opportunity to participate in the training programs. A number of participants reported that the training programs were not fruitful for them because they could not apply the knowledge due to their lack of capital and land for nursery plantation or other economic activities.

Figure 4.3: Nursery development by a beneficiary

(Source: Ferdous, F. Rahimapur Forest, 2016)

4.5.3.6: Employment as Forest Guards at Rahimapur Forest During the Dry Season

A number of beneficiaries were recruited as patrol guards to protect against poaching of valuable timber from the Rahimapur forest. All of them were paid reasonable wages for their protection service. These forest guards also ensured the protection of growing saplings from cattle aggression and other threats. Guards were supervised to protect the trees from cattle aggression, illegal cutting of forest trees and community people's unnecessary access to the forest.

During interviews and FGDs with forest guards, they commented that due to their regular patrolling, illegal cutting of forest trees had been reduced. Even when they found people cutting trees at night, the forest guards with CBO members rushed to the spot to protect the forest and its resources. This initiative was found to bring a noticeable change in Rahimapur forest, whereby a significant reduction in illegal activities was achieved. However, a few female members also patrolled the forest during the day time voluntarily. Haider and Kabir (2014) shared a similar experience from LNP in Bangladesh where when illegal loggers were appointed as forest watcher they reacted more positively towards the co-management program compared to those who received other economic incentives like poultry and livestock rearing. This was because community members felt important when they were trusted with such a responsible job of protecting the forest, and responded positively and cooperated with the project (Mukul et al., 2014). However, a drawback of appointing local villagers as forest guards has been that sometimes the forest guards themselves were found to be involved in illegal activities as they were well informed about the condition of the forest.

Figure 4.4: A female member patrolling the forest (Source: Ferdous, F.)

4.4.4: Raising Awareness regarding Wetland and Flooded Forest Resources

In a co-management project, it is a major challenge for conservation when most of the community members lack awareness of the importance and long term benefits of biodiversity conservation and sustainable forest management (Rahman, 2017). In the SFRS project, CNRS took the responsibility to develop and implement awareness programs in order to mobilize and motivate the local communities for biodiversity conservation and flooded forest management. During the first two phases of the SFRS project, CNRS developed several awareness campaigns with the CBO and local community members to improve their knowledge and understanding of ecological goods and services as well as the importance of conservation and management of flooded forest resources. Awareness raising sessions included monthly meetings with villagers, rallies, folk song and folk theatres and organizing parent teacher associations in schools. The goal was to make them responsive to conservation and management benefits, access rights to forest resources, decision making and other social issues. Awareness campaigns organized by CNRS members and their discussions of conservation issues with local communities helped to motivate them to act against deforestation, bird hunting, using engine driven boats inside the forest, and to understand the

anticipated benefits of such conservation measures. Community members were able to understand the potential of wetland and flooded forest resources and their sustainable use and management. In such awareness campaigns, relationships of trust were built and common rules of meetings and connectedness in groups built up the social capital of the community, which was crucial for shaping individual action to achieve positive outcomes from the project (Pretty and Smith 2004).

The SFRS project, through motivation and awareness building campaigns, has improved people's knowledge and understanding of forest and biodiversity conservation, as well as of their importance. I asked respondents about their understanding of the current condition of Rahimapur forest and impacts of the SFRS project in their lives. More than 95% of respondents reported that the biodiversity of the Rahimapur forest has been improving due to conservation and management efforts by the SFRS project and protection by the CNRS and CBO members. They believe that, due to the conservation and management initiatives of the SFRS project, the forest is growing well and natural regeneration is occurring. One of the respondents said that:

> I am forty years old and I have grown up in this village watching this forest and playing around it. But I have never seen this forest to be such green and beautiful as it is today. I remember couple of years ago, I could even count the remaining trees of the forest. But now there are hundreds of trees. I do not care about what benefits I get from this forest, I am happy to see the forest being conserved by the project. (A male member, Rahimapur forest)

In another respondent's words:

> The forest almost disappeared before the intervention of SFRS project. Only a few trees remained in the forest and there were very few animals in this area. I thought that in 15 to 20 years, community members might colonize the area. Fortunately, the SFRS project intervened and after seven years of the project, we can see how the forest has grown to a

much dense forest. We hope and pray that the forest should remain like this forever. (A small businessman, Rahimapur forest)

About 50% of respondents said that they had heard the term "biodiversity"; by which they meant various types of trees and animals living in the Rahimapur forest. They stated that conserving biodiversity in Rahimapur forest and at the homestead level will provide them many goods (such as vegetables, fruits, fuel wood) and services (such as pure air, shade) in meeting their everyday needs. Respondents commented that forest conservation has also contributed to increasing the amount of wildlife in the forest. They said that they see many migratory birds frequently now, which was not possible in the recent past.

The following sub-sections describe programs and activities that were organized with community members by the SFRS project under the awareness campaign program.

4.4.4.1: Monthly Meetings

During first phase of SFRS (2009-2012), CNRS conducted 21 community meetings with people in the project area. An average of 50-55 participants, including fishermen, farmers, women, and cattle/goat owners attended these meetings and discussed various problems regarding management of the flooded forest and cattle/goat grazing. The meetings were held on a monthly basis. Community members were encouraged to abandon all kinds of harmful activities in the forest, including using engine driven ferry boats, fishing boats and nets during the wet season.

4.4.4.2: Folk Song and Folk Theatres

CNRS members, with the assistance of the CBO, organized folk songs and dramas to create awareness among the community members. The main objective of the folk song program was to make the community people aware of deforestation problems and forest conservation management issues, discourage cattle/goat grazing in the forest, and for the amusement of participants. In this

process, the executive committee of the CBO took the initiative to take action under the direct supervision of CNRS. Their activities included selecting locations, lyrics and artists, and preparing program schedules, guest invitations, decorations, a sound system and publicity within villages. A total of 1,015 community members including male, female and children enjoyed the folk songs and drama program.

4.4.4.3: Meeting with Parent Teacher Association (PTA)

To ensure the sustainable management of Rahimapur forest, CNRS organized several PTA meetings during the first phase of the SFRS project. The focus of the meetings was to deliver the message of the importance of conserving flooded forests and natural resources among the community members through parents, teachers and students. CNRS organized three PTA meetings in 2011 to build up awareness among 80 PTA members (Table 4.7) (CNRS, 2011).

Table 4.7: Information about PTA Meetings

Project area	Union	No. of PTA Meetings	No. of Participants
Rahimapur Flooded Forest	Beheli	1	40
Rahimapur Flooded Forest	Sachna Bazar	2	40

(Source: CNRS, 2011)

4.5: Development of Community-Based Organization (CBO)

Community level management cannot be performed effectively by the implementing organizations alone because of the social-ecological complexities of communities. Joint actions with local institutions in the management system for flooded forest resources are necessary to ensure sustainable management.

In the SFRS project, a CBO was formed by CNRS, with the consent of community members, in order to successfully implement the community-based restoration and management of Rahimapur forest and to ensure the active participation of communities in achieving the project goals and objectives. Several meetings with local communities were conducted to identify flooded forest resource users and their livelihoods. All community members were brought into this process, including farmers, small businessmen, landowners, teachers, poor fishers and the landless. Once identified, a CBO was formed by considering some specific criteria, such as the extent of community members' dependency on forest resources, economic condition, education and occupation, in order to ensure their active participation in forest resources management processes. A CBO was formed at the beginning of the project and was mobilized to perform the project activities under the guidance of CNRS.

The CBO, named *Rahimapur-Hariharpur Bon O Paribesh Bhittik Krishi Somobay Somitee Limited*, consisted of 36 members, of which 23 were male and 13 were female. It had an executive committee of nine members, elected by the CBO members to implement and monitor project activities. The executive committee was comprised of the President, Vice-President, Secretary, Assistant Secretary, Cashier and General members. This committee was elected through a democratic process by the CBO members. Activities and responsibilities of CBO members were guided by CNRS. The CBO was registered by the District Council administration (i.e. local government body at the district level) with an approved constitution.

4.5.1: Capacity Building for Effective CBO Engagement in the SFRS Project

In order to build the capacity of CBO members, a number of training programs on flooded forest conservation and management and other various aspects of development were conducted during the implementation of SFRS project activities. Experienced CNRS members, some agriculturists

and forest officers of Sunamganj conducted the training sessions with the CBO. There were three types of training programs: i) flooded forest management (e.g., systematic harvesting mechanisms, regeneration and conservation of flooded forests); ii) alternative income generation (e.g., nursery development, poultry, duck and livestock rearing, tree grafting, vegetable gardening); and, iii) institutional development (e.g., leadership development, accounts and financial management, credit management). The training programs were implemented with a participatory approach, and followed some important methods such as lecture, brain storming and group discussion. CBO members and other participants were provided necessary handouts.

The main objective of the training on flooded forest management was to help participants gain technical knowledge and practical experience in systematic harvesting and management of flooded forests. During the training sessions, all the CBO members of Rahimapur forest had an opportunity to visit various successfully managed flooded forests and exchanged their experiences and knowledge with the CBO members of other flooded forests. During the training sessions, issues like the Social Forestry Rules 2004, profit distribution, social forestry management, participatory planning, monitoring and evaluation were also discussed. Detailed information on training courses is given in Table 4.8.

Table 4.8: Detailed information of training programs for CBO members

Serial No.	Type of Training	No. of Male participants	No. of Female Participants	Total Participants	Date
1	Training on Organizational and Leadership Development	16	04	20	09.03.2010
2	Training on Organizational and Leadership Development	18	12	30	11.03.2010
3	Training on Flooded Forest Management	24	03	27	16.06.2010
4	Training on Flooded Forest Management	24	03	27	17.06.2010
5	Training on Flooded Forest Management	17	14	31	23.06.2010
6	Training on Flooded Forest Management	17	14	31	24.06.2010
7	Training on Flooded Forest Conservation, Management and Panning	53	22	75	19.03.11 to 20.03.11
8	Training on Organizational and Capacity Development	53	22	75	23.03.11 to 24.03.11

(Source: CNRS, 2014)

4.5.2: An Assessment of the CBO Activities (Performance of CBOs in managing SFRS Project Activities)

The success of a co-management program depends on how CBO members take responsibility for implementing project activities. My study of the CBO under the SFRS project revealed that the CBO has, under effective facilitation, supervision and support from CNRS, performed efficiently in implementing the participatory action plan aimed at achieving project goals and positive impacts from flooded forest management of Rahimapur forest. CNRS, as the implementing organization of the project, mobilized CBO members to perform group activities (Figure 4.5), and provided field level support to engage them in flooded forest conservation and restoration. They were provided with training and issue-based awareness raising sessions on flooded forest and wetland resources, plantation activities, systematic harvesting and sustainable conservation and management of the forest. In addition, basic training on group development, leadership, social issues and self-finance was also provided to the CBO members (Table 4.8).

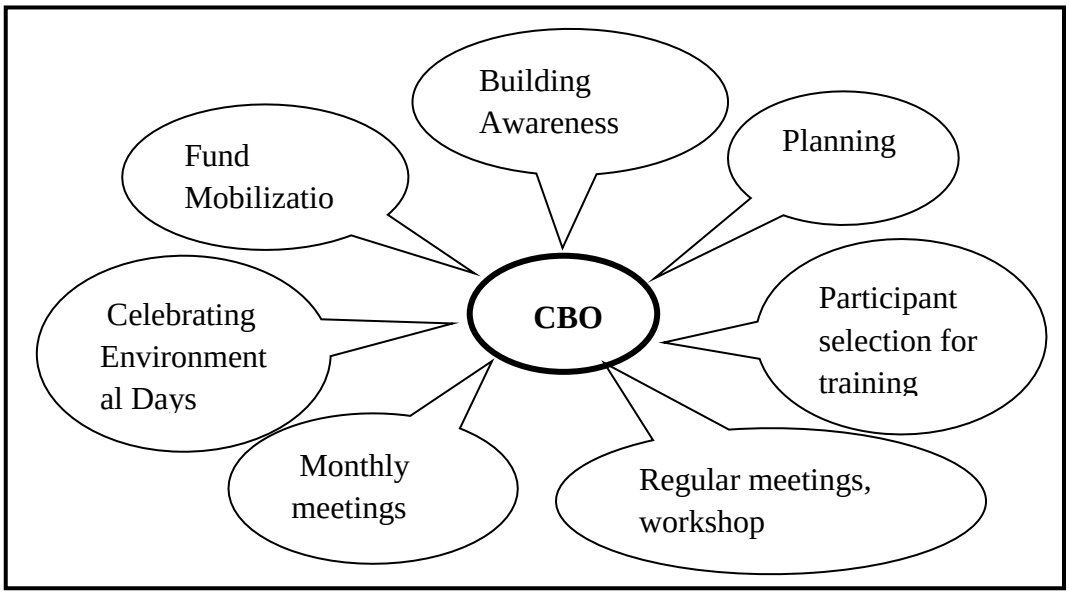
The overall evaluation of the CBO has shown that CBO members played an important role in the implementation of their tasks, which was affirmed by CNRS representatives. This study found that CBO members made significant contribution in maintaining many attributes of flooded forest management, including: i) developing and strengthening their connection with local communities, ii) sharing knowledge and experience with community members, iii) building capacity, and, iv) making rules and regulations for resource use in Rahimapur forest (such as banning boating and fishing during the wet season). In the following sub-sections, I present a few examples of the CBO's many achievements in collective action under the community-based management approach in Rahimapur forest.

4.5.2.1: Restoration of Rahimapur Forest

Under the supervision of CNRS, CBO members were involved in designing the afforestation program of the SFRS project, identifying potential areas for plantation, sapling collection, nursery management, protecting the newly planted saplings in the forest and informing stakeholders about the benefit sharing mechanism. These activities were carried out through community meetings and by developing a shared set of norms and understandings about the activities of the SFRS project. The major actions carried out by the CBO under the SFRS project were:

- To accomplish the plantation activities, a four member PIC was formed by CBO members. The PIC worked as the plantation sub-committee in implementing plantation activities, monitoring the forest according to the code of conduct, and reporting back to the CBO and CNRS members.
- Some of the male CBO members were appointed to guard newly planted saplings in the forest area while some poor women worked watering planted saplings during the dry months (March-April).
- A resource harvesting code of conduct was developed by CBO and CNRS members outlining the rules and regulations for using and harvesting forest resources. For example, it was decided that local villagers would be allowed to collect forest leaves with prior permission from the CBO members. Moreover, when the SFRS project will be terminated in 2019, the forest will be divided into four blocks, of which one block will be conserved and the remaining blocks harvested in a sustainable manner.
- In order to enhance the conservation effort, CBO members arranged awareness campaigns to encourage the local communities to act against deforestation, bird hunting, using engine driven boats and other prohibited activities in Rahimapur forest.

Figure 4.5: Activities of the CBO



(Source: Ferdous, F. Rahimapur Forest, 2016)

4.5.2.2: Savings and Fund Mobilization for Sustainable Forest Management

In order to strengthen the continuation of sustainable forest management activities, even after the completion of the SFRS project, CBO members managed to generate a fund. A total of 85% of CBO members attended meetings and deposited savings regularly. Fund generation, operation and maintenance by CBO members helped them in carrying out other organizational activities and has strengthened their capability to run the project smoothly during and after the SFRS Project period.

4.5.2.3: Organizing Field Days

With the assistance of CNRS, CBO members have organized programs on several environment related days since 2011. CBO members organized multiple events on environmental days (Table 4.9) to raise the awareness of students, teachers and community people regarding the significance of flooded forests and the importance of flooded forest management for biodiversity conservation and a healthy environment.

Table 4.9: List of Celebrated Events

Serial No.	Name of day observation	Date	Activities taken	Participants
1	World Wetland day	2nd February	Discussion and rally	Students, teachers, community people
2	Forest Day	21st March	Rally, culture program and essay writing	Students, teachers, community people
3	Earth day	22nd April	Discussion and rally	Students, teachers, community people
4	World Environment day	5th June	Discussion and rally	Students, teachers, community people

(Source: CNRS, 2013)

4.5.2.4: Creating Awareness through Red Flags and Billboards

To protect saplings and trees in Rahimapur forest in the wet season, CBO members placed red flags to demarcate the forest area and alert community people, including fishermen and boatmen, to not access the forest. During the project period, 70 red flags were placed in this forest by CBO members. As a result, access from engine driven boats and fishermen was reduced in the demarcated area (Figure 4.6).

Figure 4.6: Red flags placed in Rahimapur Flooded Forest during wet season

(Source: CNRS, 2013)

To make local people aware of the SFRS project and the initiatives taken by AF and CNRS to restore Rahimapur flooded forest, CBO members placed billboards along the village streets and project site with slogans and eye-catching images.

4.6: Discussion

Monitoring and assessing the success of restoration projects are crucial for providing insight into project's successes and challenges, which could guide the project with developing necessary management interventions and following best practices in the future (Kanowski et al, 2010). The findings of my research suggest that diverse stakeholders were represented in the CBO, and the CBO members conducted regular meetings and engaged other community members in collaborative activities including patrol groups, nursery plantation and various AIG activities. A similar procedure was successfully adopted in the same area under another co-management project, the Integrated Protected Area Co-management (IPAC) in Teknaf Wildlife Sacntuary and LNP, but this was in a different habitat (i.e. non-flooded forest) (Fox et al., 2013).

The specific resource management activities undertaken by the SFRS project were the same as those often recommended by community-based natural resource management programs. Activities such as plantation, tree conservation, no fish zones and re-greening activities serve to safeguard and restore natural resource capital, which generally shapes the human and social system in combination to be more resilient to change. There are several examples of activities like soil and water conservation, agroforestry and plantation in Guatemala, Cambodia and Kenya, and all of these co-management programs have elements for restoring, protecting and increasing the productivity of the natural resource base (Anderson and Mehta, 2013).

The analysis of the abundance of *Hijol* (*Barringtonia acutangula*) and *Koroch* (*Pongamia pinnata*) trees in Rahimapur forest revealed that they have increased in a significant number. A

similar result was found by Haider and Kabir (2014) at LNP under the co-management approach of IPAC project. They found that the intervention of IPAC project increased the species richness and abundance in the core zone and dense area of the park. However, in the case of the Brazilian Atlantic Forest, failures in restoration of degraded lands were noted in a number of projects. The reason for such failures was the use of only pioneer species. Since only pioneer trees were used in these projects, they matured very fast and died before climax species could colonize the area (Rodrigues et al., 2009). Some examples of successful biodiversity conservation following a co-management approach are conservation in western Mexico (Gerritsen and Wiersum, 2005), community-based mangrove forest management in Thailand and forest management in north-west Pakistan (On-prom, 2014).

The SFRS project's AIG programs are concentrated on: biodiversity conservation at the homestead level, reducing communities' dependency on forest resources, and economic development for community members. The IPAC project focused on similar thematic areas while generating AIG activities for protected areas in Bangladesh, namely: watershed protection, biodiversity benefits, landscape beauty and carbon sequestration (Landell-Mills and Porras, 2002). Though AIG activities are motivated by environmental concerns, sometimes the growing interest of stakeholders for development benefits is difficult to achieve (Chowdhury, 2013). Therefore, the extent to which the two major objectives of co-management approaches (i.e. biodiversity conservation and development of local livelihoods) can be achieved simultaneously is difficult to evaluate.

Employment is considered one of the main benefits in co-management projects that helps improve livelihoods, particularly in poor villages. In the SFRS project, employment opportunities made a small contribution, only benefiting the forest guards and nursery entrepreneur. The SFRS

project also arranged a number of other opportunities, however these were mostly seasonal employment (for example, day labor during plantation programs). A co-management project in Botswana managed employment for about 610 community members and 14 CBO members in 2011-12 (Mbaiwa, 2015). The same study showed that in Botswana, about 8,000 people were employed in different co-management projects, which represents a substantial contribution by the project. Such employment opportunities provided by projects contribute to poverty alleviation and bring social security to poor people. These employed members financially support their families, and hence raise the standard of living of their households.

There are examples of co-management programs meeting economic, environmental, capacity building and empowerment goals on a sustainable basis. However, there are also cases that have shown failure or limited success (Reid et al., 2009). The conditions under which a co-management project will succeed or fail vary significantly at the very local level (Reid et al., 2009). Moreover, the extent to which co-management principles and best practices are enforced is diverse (Child, 2005). In a given country, therefore, the same co-management approach can have different results. For example, the IPAC project, established in several protected areas in Bangladesh, showed varying results in different areas. IPAC in Teknaf Wildlife Sanctuary was considered to have positive impacts on the conservation of forest resources and livelihoods of local communities (Belal, 2013). However, IPAC in SNP and Bhawal National Park was regarded as a failure since serious problems were identified regarding faulty representation of actual stakeholders, minimum collaboration between the project and the government and lack of support for AIG activities. The IPAC project was considered unsustainable in these areas (Chowdhury, 2013).

Nelson and Agrawal (2008) reviewed the co-management approach in selected countries of Eastern and Southern Africa and found that only Namibia and Botswana were successful in

implementing co-management programs. In contrast, Kenya was considered an example of failure in co-management programs, while other countries were ranked somewhere in the middle. Similarly, over the 20 years of implementation of co-management in Botswana, it has showed mixed results (Mbaiwa, 2015). Some projects have been relatively successful in achieving either biodiversity conservation or livelihood security for local communities, such as employment creation, generation of income and provision of social services. However, many other projects collapsed. Mbaiwa, (2015) explained that there are various factors that explain the performance and challenges of each project (e.g., lack of capacity building, misappropriation of funds, unavailability of skilled personnel in CBO). In a nutshell, the achievement or failure of a co-management project depends on various factors, which include the effectiveness of the institutional framework of a particular co-management project.

4.7: Conclusion

The SFRS project initiated a significant number of forest conservation and livelihood development activities in the project area that engaged beneficiaries and local community members. CNRS members developed two local organizations, namely the CBO and PIC, to carry out project activities. CNRS members selected a total of 200 beneficiaries from the forest-dependent local communities by analyzing criteria such as people's education level, economic condition, amount of land ownership and their level of forest dependency. Stakeholders were mobilized by CNRS and CBO members in four major areas: i) tree plantation, conservation and management of the forest and homestead level, ii) capacity building activities for project beneficiaries, iii) AIG sources for poor forest-dependent users, and, iv) raising awareness regarding wetland and flooded forest resources. Partnerships of government organizations, NGOs and the CBO under the SFRS project were developed to support the beneficiaries during training on organizational and capacity

building activities. CBO members were trained by CNRS members to increase their capacity to undertake project activities and to achieve the project goals efficiently. The following chapter presents a critical analysis of how these initiatives of the SFRS project affect the local communities' livelihood strategies and outcomes.

Chapter 5: Impact of SFRS Project on Livelihoods

5.1: Introduction

In this chapter, I discuss findings concerning my second objective, which was to explore how livelihood strategies and outcomes are affected by capital assets under the framework of SLA during the SFRS project period. Emphasis has been given to the livelihood practices of community members using the UK DFID's sustainable livelihood model. The contributions of the SFRS project in changing the natural, human and social capital of the project area are examined in light of the fact that the main focus of the SFRS project was to promote restoration and conservation of the flooded forest with the active participation of local people, and to simultaneously build their capacity in achieving a sustainable livelihood. As well, changes in the financial and physical capital of the communities as a result of the SFRS project activities are examined.

5.2: SFRS Project in Rahimapur Forest: Impacts on the Forest, People and their Livelihoods

The livelihood patterns of the inhabitants of the seven studied villages are not very different from people of other wetland areas of rural Bangladesh. The communities living around the Rahimapur forest are mostly dependent on an agricultural economy. Some of them are involved in fishing and a few are engaged in small business. Many villagers work as local labourers during the season of paddy harvest and work in cities during off-season periods. Some of the local labourers were employed in planting flooded trees within the forest area during the first two phases of the SFRS project. In this section, I analyze how SFRS project activities have been shaping the capital assets of these communities under the SLA framework.

5.2.1: Social Capital

Social capital is defined as "the web of social relationships that influences individual behavior and thereby affects economic growth" (Pennar, 1997; P:154). From the perspective of sustainable livelihoods, social capital refers to the idea of upholding the values of social norms, attitudes, bonds, social responsibilities and a culture of mutual dependence and trust (Pretty and Ward 2001). As mentioned in chapter two, social capital implies a complicated relationship between society and individuals that shapes their behaviour and livelihood objectives (Pennar, 1997; DFID, 1999). It encourages society to build a social network (Xu et al., 2015), which eventually helps households to make appropriate livelihood decisions and assists them in dealing with numerous stressors (Pennar, 1997). Among the community members of the SFRS project site, social capital can be measured by examining their membership with different NGOs, their relationships with family members, friends and relatives, CBO and CNRS members and their own social status.

Findings of my research show heterogeneity in terms of the social status, religion and caste of the households at the project site. It was found that 85.7% of respondents have had some form of membership with NGOs for micro-credit, and 27.2% of them took loans from more than one NGO. A total of 63.2% of the members were engaged with multiple NGOs, and attended meetings and training programs arranged under the project (Table 5.1). The multiple NGO users were found not to seek help from others for managing their livelihood. They expressed that membership in multiple NGOs helped support their own livelihoods, and sometimes even to help friends and relatives. The community members of the project site also learned about the formal system of banking by leaving or avoiding traditional moneylenders. One of the respondents shared his view:

> I was very scared of taking loan from NGOs since I did not know the actual system of micro-credit. I thought I might face legal actions if I fail to pay monthly interest. But after

attending monthly meetings of CNRS, I learned that the process is simple. Though CNRS did not provide micro-credit to the villagers, they taught us the rules and regulations of micro-credit program. I have taken loan from two NGOs and have built a small shop in front of my house from that money and now I am doing good business.

However, borrowing from multiple NGOs sometimes forces poor people to fall into a dependency trap through getting involved in a borrowing treadmill (Khan, 2004). In my project area, 15.5% of respondents shared their experience of taking additional loans to pay their existing loans.

Table 5.1 Relation between Trained respondents and their engagement with NGOs

Number of respondents engaging with NGOs	**Respondents attending meetings and training programs**		
	No	Yes	Total
None	8 (80%)	2 (20%)	10 (100%)
One NGO	36 (87.8%)	5 (12.2%)	41 (100%)
Multiple NGOs	7 (36.8%)	12 (63.2%)	19 (100%)
Total	51(72.8%)	19 (27.2%)	70 (100%)

(Source: Ferdous, F. Rahimapur Forest Field Survey, July-October, 2016)

If a community has a large social network available for assistance when seeking help, it is more likely that community members will be able to obtain useful information on various household issues, such as following several AIG activities. In my study area, 27% (19 respondents) of respondents attended meetings and training programs under the SFRS project, and most of them were capable to help their neighbours and relatives with money, food or other necessary products. On the contrary, 73% of respondents did not attend meetings and training programs, and 35.5% of these respondents were dependent on their neighbours for money and food. Thus, the poor people

rely on their social networks, which can help them in times of urgent need of money. As a result, they turn to their friends and relatives for loans. During this process of borrowing and lending, trust is built and relationships are further strengthened among the community members. The social network of a household expands by increasing the number of friends and relatives available for financial and other assistance.

5.2.1.1: Association of Community Members with Local Government

During the first two phases of the project, CNRS linked 140 community members with the *Union Parisad* under government safety net programs, named Vulnerable Group Development (VGD) and Vulnerable Group Feeding (VGF). VGD was a two year program for the 2011-2012 period and seven beneficiaries were engaged with this program. VGF is a list of community members prepared by the *Union Parishad* and food is distributed to them in emergency periods. CNRS took the initiative to include 130 beneficiaries in VGF and managed an honorarium for three senior citizens in the project area (Table 5.2). These initiatives helped the community members to make connections with the local government, which strengthened the bond of social networks.

Table 5.2: Linkage of Development with Local Government

Project site	VGD program	VGF program	Senior's honorarium
Rahimapur Forest	7	130	3
Total	140		

(Source: CNRS, 2013)

5.2.1.2: Social Learning and Capacity Building

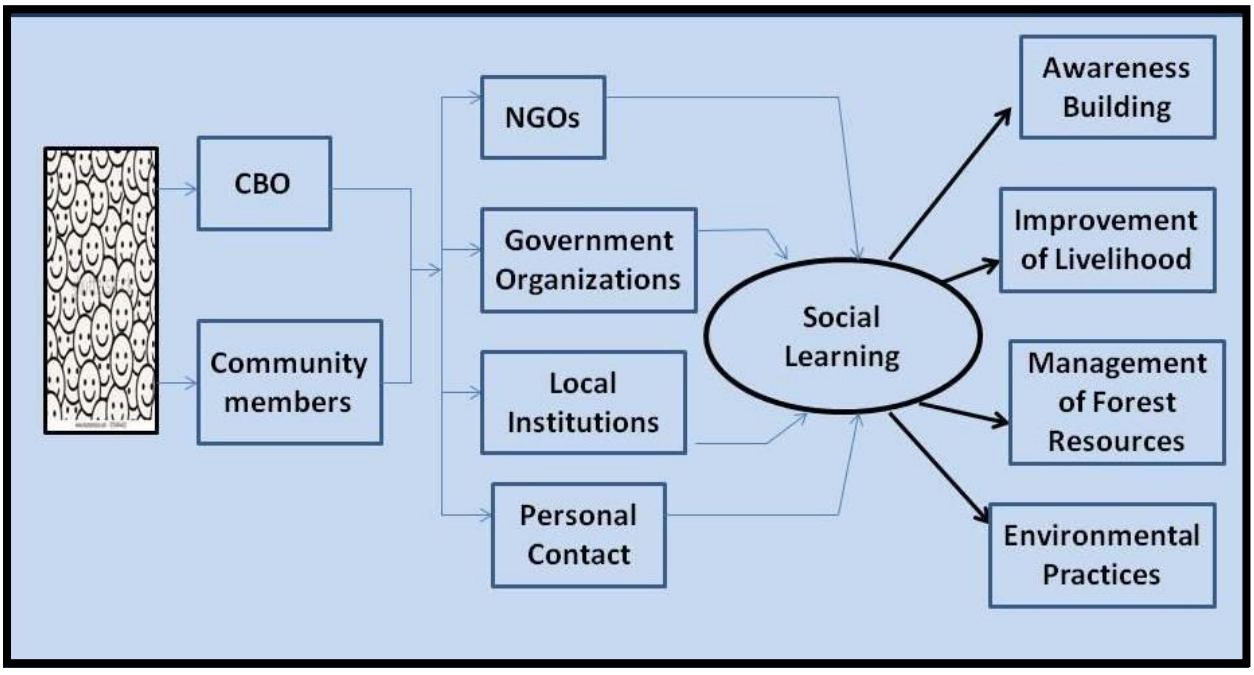
Social learning is experienced by communities and organizations through interaction and collaboration with them (Baron et al., 2003). Scholars like Marschke and Sinclair (2009) encouraged place-based cognitive learning where community people live and interact. In my study, I found that community people learned through group interaction, group meetings arranged by CNRS, CBO meetings and from the way individuals deal with particular situations. The participatory approach of the SFRS project facilitated the formation of groups, such as PICs and the CBO, comprising both females and males from the community to implement planned activities. These groups helped the project to reach the grassroots level community members.

In order to achieve the project goals, during various stages of project implementation CBO members were directly and indirectly supported by NGOs (e.g., CNRS and AF), government organizations (e.g., *Upazilla* Agriculture Officer), local formal and informal institutions (e.g., local mosque committee) and influential persons. Dealing with these organizations helped CBO members to learn to adapt with continuously changing social norms and behaviours. They acquired knowledge about various legal and paralegal issues, child education, health, and other issues that impacted their lives and status. Through the community meetings with CBO members, local people obtained an opportunity to learn about divergent issues, and hence, such deliberation can be seen as a mutual learning process for all the community members involved. This mutual learning and collaborative development of shared knowledge by various stakeholders through "learning by doing" is viewed as social learning by Armitage et al., (2009).

Social learning is an interactive approach that helps in decision making and problem solving (Woodhill 2004). It is a process among different stakeholders, which has a significant role in facilitating individual cases of participatory management (Thompson, 2013). It contributes in

conversation and discussions where different stakeholders are equally informed and are able to raise their voices with their own opinions while respecting others' opinions. Such participation in a democratic forum often results in enhanced learning, participants accepting others' views as being legitimate, and recognizing shared values and needs (Innes and Booher, 2004). CBO members were found to play an important role in social learning through conversations with local people and by directly sharing their learning experiences on diverse issues with other community members. Some of these lessons were related to: livelihood improvement and diversification, purposive use of general loans and micro-credit (which ultimately increase their monthly income), awareness of child education, health and sanitation, the importance of the flooded forest and its management, informal rules of natural resource management, adopting different AIG activities and good environmental practices through project interventions (Figure 5.1).

Figure 5.1: Social learning and its impacts on communities



(Source: Ferdous, F. Rahimapur Forest Field Survey, July-October, 2016)5.2.2: Human Capital

According to U.K. DFID (1999), human capital is represented by knowledge, skill, experience, and the inherent ability of an individual to adopt different livelihood strategies and achieve their livelihood objectives. It is the capability of an individual that reflects the stock of knowledge, education, experience and skill embodied in an individual, which helps in increasing their personal, economic and social well-being (Helliwell 2001, cited in Rudd 2004; P:114). It helps people to be capable of producing more and offers them scope to engage with the world in a more productive and meaningful way (Sen, 1997).

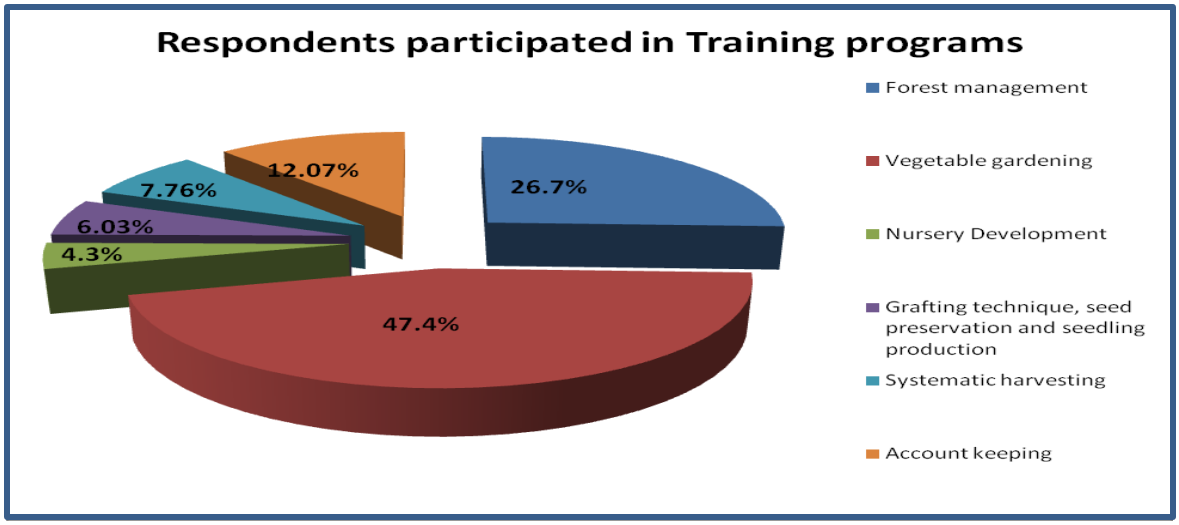
A study of human capital is important, especially for people living near flooded forest areas, since a broad mix knowledge, skill and a thorough understanding of the forest resources of local people will have a great impact on the resource management of that forest. It is widely known to play a key role in successful livelihood diversification (Ellis, 2000). Education level is one of the most important indicators for measuring human capital; it includes the percentage of students studying in schools (Malhotra, 2000). The data reflect that from my study area 39% of the household heads had no formal education, while only 41% had primary level (grade Five) and 14% had high school level (grade Ten) education. Only 4% of household heads passed the Secondary School Certificate exam, and only 1% had graduated with a bachelor degree. Despite the fact that all seven villages were very close to a school, the percentage of formally educated people was very low. However, the importance of education and skills has been rapidly changing and was being recognized even by parents with no or a low level of formal education. Reflecting upon this changing trend in the human resource and rural conditions, one of the beneficiaries said:

> I used to do farming in the past since I had no skills or formal education, and we had large amount of agricultural lands. But we had to sell those land later because of some unavoidable circumstances. Now I work as a seasonal farmer (i.e. grow crop on other's lands during crop season) and I also keep my livestock. Keeping livestock is much more

costly nowadays since we have restrictions in using the forest resources as fodder. I do not want my children to be like me. Therefore, we are trying give education to our children so that they can manage to get good jobs.

A Chinese proverb says “to plan one year, sew seed; to plan ten years, plant trees; and to plan 100 years, develop human resources” (Nawaz, 2009). The importance of both academic and informal education lies in developing the capabilities of an individual as established by modern thinking, thereby eliminating illiteracy and addressing the lack of skills, which enhances efforts for poverty alleviation (Ellis, 2000). With this view of providing informal education on various issues, a number of meetings and training programs were organized by the SFRS project on several issues, including vegetable gardening, forest management, tree plantation and systematic harvesting. These training and skill development programs were given to all the beneficiaries in 2012. A major section (47.4%) of the beneficiaries were trained on vegetable gardening and some (6.03%) were trained on seed preservation, seedling production and grafting techniques (Figure 5.2). A total of 26.7% of respondents were trained in forest management and systematic harvesting of flooded trees so that they could gain knowledge and apply it in forest harvesting in the future. Such meetings and training programs developed an awareness of the rules and procedures to guide their behavior, and were helpful for the people to improve their performance in their current jobs (such as farming and vegetable gardening) and to prepare themselves for desired future jobs.

Figure 5.2: Respondents participated in meetings and training programs of SFRS project



(Source: CNRS, 2013)

A respondent described the process and benefits of the training programs in the following words:

> We attended training programs where we learned about vegetable gardening, seed preservation and seedling production which helped me make my homestead garden. During meetings with CNRS and CBO members, we learned not only about forest conservation but also about the importance of child education, health, family planning, sanitation, environment and cleanliness. Now we are more knowledgeable about the importance of child education and sending all the children to school. (A female member, Rahimapur forest)

It was found that the education level among the trained respondents' families was much higher than that of the most other families in the project site. All children of these families were attending school, including large families where the number of children was in the range of 7 to 10. On the other hand, 18.6% of families were not sending their children to school at all (Table 5.3). This section of community members did not attend any meetings or training programs. It can be assumed that families that participated in SFRS meetings and training programs were more aware about child education and were financially capable to educate their children. The primary

school was very close to the project area. In Bangladesh, primary level education is free for all students, and stipends for female students are also offered. Hence, lack of awareness regarding child education could be a principle reason for this lack of school attendance. However, poverty has a significant negative impact on child education. Sometimes young children work with their poor parents to earn money. In my study area, 42.3% of respondents highlighted poverty as the primary reason for not sending their children to school.

Table 5.3: Relation between the trained respondents and the number of their children attending school

Total number of children attending school	Yes	No	Total
0	0	13 (100%)	13 (100%)
1-3	10 (22.7%)	34 (77.3%)	44 (100%)
4-6	8 (66.7%)	4 (33.3%)	12 (100%)
7-10	1 (%100)	0	1 (100%)
Total	19 (27.1%)	51 (72.9%)	70 (100%)

(Source: Ferdous, F. Rahimapur Forest Field Survey, July-October, 2016)

The meetings and training programs organized by the SFRS project had significant impacts on the thought processes of community members. 58% of the respondents expressed that there was a moderate possibility of the SFRS project to securing their livelihood, whereas only 17% thought that the probability of success was much higher. The rest of the respondents felt that the SFRS could not play any role in improving their livelihood activities. However, 73% of the respondents

believed that the project was beneficial for conserving forest resources. Knowing the fact that the SFRS project's initiative for forest conservation would not open the option for them to use forest resources, they believed that the project was important for forest conservation and served the community interests.

5.2.2.1: Human Capital and Women's Empowerment

In Bangladesh, women constitute almost half of the population, of which about 85% live in rural areas. The social structure of the country is plagued with various problems including poverty, illiteracy, unemployment and malnutrition (Asaduzzaman, 2015). According to Ali (2012), the rural social system of Bangladesh places women in deprived and unequal position. For example, women face social and religious restrictions on work outside of their homestead. Their activities are thus limited to household management, child care, processing of rice and maize and providing service. Although practical evidence indicates that there is substantial gender discrimination in all types of families living in Bangladesh, a higher level of gender difference between male and female was found among the rural households in Bangladesh (Begum, 2005). Women were considered economically unproductive for a long time, in the sense that their contributions were not acknowledged in accounting for the GDP of the country (Asaduzzaman, 2015).

However, in Bangladesh, opportunities for women have changed extensively in recent years. National policies attempted to utilize its manpower, including women, to play a significant role in economic development, which was a major shift in the socio-economic priority and structure of the country (Nawaz, 2009). CBRM programs in Bangladesh are also being used to reach poor women by improving their livelihoods and upgrading their economic, social, and political statuses. Women’s empowerment is related to their access to education, income generating opportunities, health care and legal rights. It is also associated with women's

participation in household decision-making processes as well as the allocation of resources within the household. Studies have shown that increases in women's participation in household decision-making processes generate positive impacts on the health, education and nutrition of their children (Todaro and Smith, 2003). Therefore, women's empowerment is considered a significant human capital in the context of rural livelihood development. In this regard, Houston and Huguley (2014) stated that the improvement of women's human capital has positive implications for building the human capital of their children and eventually of the society. They suggested that investments in women's human capital have greater impacts for the long-term development of developing countries, like Bangladesh.

5.2.2.2: Women's Empowerment in the Project Area

> We always try to engage women in our projects. Because it is proven that once women are solely engaged in a project, the project will be successful. If women are convinced that the forests are 'ours' and 'we' have to protect it for our wellbeing, they blend themselves with the program (i.e. the CBRM project) and then it becomes their program. (Farid Uddin Ahmed, Chairperson, AF)

In Bangladesh, most of the development and management programs by government, NGOs or international organizations have provisions to involve women, but the male dominated society limits the active participation of women. In recent years, a number of NGOs like CNRS have begun to play a significant role in socio-economic development by empowering women and engaging them in natural resource management activities under co-management programs like the SFRS project. They build women's capacity by providing micro-credit and training programs in various income generating activities. Such projects inspire women and give them courage to break free from the chains of fixed patterns of belief and various religious and traditional social conditions that have kept them dominated and disengaged in business, access to the market, and in dealing

with outer world activities (Mayoux, 1998). It has been proven that rural Bangladeshi women can manage the forest as well as other natural resources in an effective manner while maintaining environmental sustainability (Sultana and Thompson, 2008).

5.2.2.2.1: Indicators of Women's Empowerment

Indicators for evaluating women's empowerment vary in the literature. For example, Goetz and Gupta (1996) used a five point index of managerial control as the indicators of women's empowerment, whereas Pitt and Khandker (1995) examined the impact of women's empowerment on a number of decision making outcomes. However, Hashemi et al., (1996) analyzed the impact of women's empowerment by setting a number of specific indicators: i) the level of women's contribution in the household economy, ii) their mobility in the public domain, iii) their ability to make large and small purchases, iv) assets women have in their household, v) freedom from family domination, and, vi) their political awareness and participation in various political actions.

In my study area, most of the households are male headed, those households that are female headed are either widowed or divorced. Because male members have the responsibility to earn income for their households in most cases, they seem to believe they have the right to control the female members of the family. Female members, in not holding a paying job and not inheriting any property, are considered weak and worthless and often experience violence from men (Efroymson et al., 2007). Therefore, I selected the following indicators to assess women's empowerment in the project area: i) contribution to household decision making, ii) reduction of violence against women, and, iii) assets women have in the household. The results and analysis are presented below.

Contribution to the household decision making

Women's participation in decision making refers to the extent of their ability to take part in expressing and executing decisions regarding household issues with other family members (Yasmin, 2012). In my study area, household decisions are generally made by the male members of the family. I asked women about their role in household decision making. About 90% of the respondents were able to make decisions about purchasing food stuff, stationeries for children and toiletries.

In the project area, women had no involvement in signing legal documents or buying fishing or farming equipment. It was found that males are generally in charge of taking major decisions such as purchasing land, purchasing or selling fishing or farming equipment, and signing legal documents. Interestingly, it was found that women engaged in alternative livelihood sources such as homestead gardening or duck rearing were more active in executing decisions in household matters. This is reflected in the fact that 21.4% of women owned the poultry in their household and could earn money by selling eggs and chickens to their neighbors (Table 5.4). Since these women had an additional income of their own, they were relatively financially independent. Moreover, financial contributions of women to their family uplifted their status in the family and in the society. In this regard, a CBO member shared her experience in the following words:

> My husband is a good human being and I have a harmonious relation with him. But when I asked him to get admission for my daughter to a primary school, he opposed. He thought that it will make an extra expense for us since two of our sons are already admitted to the school. Then I convinced him saying that we can use the money I have saved by homestead gardening; he gave his consent. Now my daughter is in grade two and she stood third in her class last year. (A CBO member, Rahimapur Forest)

Enhancement of respect and reduction of violence against women in their family

In rural societies in Bangladesh, women generally have little or no power in their families and violence against women is a common matter. Since the rural society is patriarchal, women are totally dependent on male members and this dependency makes them vulnerable and powerless in the society. Efroymson et al. (2007) studied the causes of violence against women in Bangladesh and found that women are considered weak and "worthless" for not holding a paying job and for not inheriting any land. Male members feel that since they earned most of the living, women should always be subservient to them. Findings of my KIIs and SSIs revealed that women who engaged in homestead gardening, forest patrolling and other CNRS initiated AIG activities were in a better position in their families than before engaging with project activities. Women explained that their husbands and other family members began to respect them. Male members also reduced or ceased physical assault and verbal abuse once women started earning money. Most of the women reported that violence against women in the form of physical assault and verbal aggression had reduced at the household level over the last few years. CBRM and AIG activities thus functioned as a means of changing men's attitudes towards women.

Assets women have in the household

Ownership of assets refers to the capability of women to have assets in their own names and derive benefits from those assets. Results of my study show that 42.9% of women had no assets in their own title, and only 10% had cash savings in the NGOs. Women's cash saving in the NGOs is an important indicator of women's economic empowerment. They can use this money in emergency situations, such as to cope with natural disasters, crop failures or the death of an earning member of the family. In the study area, 5.7% of women owned a sewing machine, which was a source of extra earning. The sewing machines were given to them by the NGOs. Interestingly, only 2.8% of

the total female respondents had ownership of land. These women were widows and they received ownership of their lands after their husbands' deaths. Only 5.7% had cattle in their own name, while 21.4% of women earned income from poultry farming (Table 5.4).

Table 5.4: Women's Assets in their own name (N=70)

Assets women own	No. of Respondents	Percentage (%)
Nothing	30	42.9
Cash Saving	7	10
Gold	8	11.4
Cattle	4	5.7
Sewing Machine	4	5.7
Poultry	15	21.4
Land	2	2.8
Total	70	100

(Source: Ferdous, F. Rahimapur Forest Field Survey, July-October, 2016)

5.2.2.2.2: Factors Impeding Women in Working on the SFRS Project

In Bangladesh, rural women's activities are largely overlooked as they do not directly operate in the market. They mostly work in the form of unpaid family labor in the informal economic sector (Afrin et al., 2010). In general, Bangladesh society is a conservative entity where the majority of the population are Muslim. My study area was equally inhabited by Hindu (50%) and Muslim (50%) communities. However, the social restrictions and barriers for women were more or less the same for all in the communities. Some socio-economic factors perceived in my study area are discussed below.

Restriction of Women's movements

Women's freedom of movement is extremely important for making their own decisions, to improve their disadvantaged positions and to mend their social network. In my study area, most of the women were engaged in microcredit programs and they had access to NGO offices. However, they confronted restrictions in accessing the market since marketplaces were considered only accessible to men in rural Bangladesh. Sometimes, they needed to access the market to buy household stuff or to sell some products like mats, dairy food products, vegetables or plants. A number of women reported that they are not comfortable to move outside the village without being accompanied by male members. Interestingly, 18.6% of respondents who were engaged with the CBO and SFRS project activities were found to move alone near villages, such as in village markets. Many women faced difficulties when the male members were out of the house, especially when the male members migrated to other villages for work. For instance, 20% of women reported that they depended on their neighbors for shopping and buying or selling products. Often women had to depend on their neighbors or hire middle-men to sell their products, which increased the transaction cost of those products.

> I have been working in plantation programs since the beginning of the SFRS project. Then I joined as a CBO member. My husband had no problem with that. But when I said to him that I want to attend meetings and training programs with CNRS, he was not very happy with my decision. He felt my in-laws will not like if I go out without accompanying any male member of my family. After a long conversation with my husband and in-laws, they agreed to let me go for training. (A CBO member, Rahimapur Forest)

Household Responsibilities

In Bangladeshi rural families, income earning is generally the duty of the male members of the family, and women and children are financially dependent on them. Women have no choice but to

live in this condition and perform all the household responsibilities of the family. Rural women's household responsibilities include child care, post- harvest activities, cow fattening and milking, duck and goat farming, poultry rearing, agriculture, horticulture, food processing, garment making and fishnet making. According to a report of Work for a Better Bangladesh Trust, (Efroymson et al., 2007), the value of unpaid household work carried out by Bangladeshi housewives is approximately US $69.8 to $91 billion per year, depending on the economic value assigned to the tasks women perform daily. Generally, rural women start their day at around 5:00 in the morning and work until sunset, having only a meal break at noon. From my study, I found that women work around 12 hours a day to perform their household responsibilities during the wet season and about 14 to 15 hours during the crop season. Most rural women have no leisure time and they bear the most responsibility for household chores, and sometimes perform income generating activities as well.

Lack of Knowledge

Lack of education, skill and knowledge impedes women in launching any income generating activities. The majority of women are still illiterate in my study area. As a result, most of the women do not understand the importance of SFRS initiated AIG activities. For example, when CNRS initiated tree grafting training for villagers in 2011, only 6 female members joined among 18 participants. Sanctions on female members' mobility are also responsible for their lack of awareness, since such restrictions hinder them from gaining as much knowledge and information as male members. They could not attend the meetings arranged by CNRS for various reasons. That is why their level of knowledge regarding conservation and management of the forest and the benefit sharing mechanism were vague compared to the male members of the society. In answering

my question "Do you know who are the beneficiaries of SFRS project?", most of the women did not know if their names were included on the beneficiary list (details are discussed in Chapter Six).

5.2.3: Natural Capital

In this thesis, as noted earlier, natural capital refers to the natural resources (such as trees, non-timber forest products, wildlife and other aquatic and terrestrial resources) that can be managed and cultivated in a natural setting using human interventions in order to achieve higher production. In wetland areas of Bangladesh, communities' dependence on natural resources is higher compared to other parts of the country. A major part of these communities is dependent on natural resources for livelihood generating activities and for daily consumption. The flooded forest provides a large number of goods and services to the community. Some of the major uses of the flooded forest are:

- *Barringtonia acutangula* trees are used for making boats and houses
- Other flooded trees are used as firewood
- Small herbs can be used as medicinal plants
- Collection of reeds and grasses
- During the dry season, grasses and small trees can be used as fodder for livestock

This section will examine how the SFRS project is playing a significant role in forest conservation, increasing floral and faunal species diversity and encouraging communities to conserve the forest. The SFRS project was initiated with a vision of restoring the Rahimapur forest and other adjacent degraded sites through an afforestation program. At the start of the SFRS project in 2009, the number of trees in this forest was 816 (CNRS, 2009). Since then CNRS has been working to conserve the existing trees and plant new trees in Rahimapur forest.

During the period from 2009-2013, a total of 22,020 trees of *Koroch (Pongamia pinnata)* and *Hijol (Barringtonia acutangula)* were planted in Rahimapur forest (Table 5.5). It was reported by the villagers and CNRS members that *Koroch (Pongamia pinnata)* had a higher regeneration capacity than *Hijol (Barringtonia acutangular)*. Moreover, the flash flood of 2010 caused 50% mortality of *Barringtonia acutangula* saplings (CNRS, 2013). According to the report of AF (2014), the survival rate of these two species was 69.21%. The once degraded forest is now in a much better condition with around 18,000 trees (Figure 5.3).

Figure 5.3: Rahimapur Flooded Forest during dry (left) and wet seasons

(Source: Arannayk Foundation)

Table 5.5 : Information on species planted during 2009 to 2013

Year of Plantation	No. of species planted		Total
	Pongamia pinnata	***Barringtonia acutangula***	
2009	13,068	800	13,868
2010	3,600	427	4,027
2011	1,600	400	2,000
2012	400	400	800
2013	900	425	1,325
2009-13	**19,568**	**2,452**	**22,020**

(Source: CNRS, 2013)

In 2011, several new species were introduced in the forest and adjacent homesteads, including *Lagerstroemia speciosa*, *Samanea saman* and *Terminalia arjuna*. A total of 1,400 nursery raised saplings were planted in the forest. According to the annual report of CNRS (2013), the survival rate of these newly introduced species was quite significant. A total of 1,400 saplings of *Lagerstroemia speciosa*, *Samanea saman* and *Terminalia arjuna* were planted, and their overall survival rate was 87.5% (Table 5.6).

Table 5.6: Information on newly introduced species in 2011

Name of Saplings	**No. of Saplings planted**	**No. of Saplings survived**	**Survival rate (%)**
Lagerstroemia speciosa	300	268	89.33
Samanea saman	100	78	78.00
Terminalia arjuna	200	168	84.00
Total	1400	1225	87.5

(Source: CNRS, 2012)

Another major initiative undertaken by the SFRS project was to discourage women from using forest products (such as leaves or dry branches) by providing saplings of various species, including wooden and fruit trees, so that they could use the leaves of these trees for cooking. Project beneficiaries were also encouraged to plant several fast growing species like *Acacia auriculiformis* and *Leucaena leucocephala* on homestead land as a source of fuel wood. Therefore, the floral species diversity of the site has increased significantly. In 2011, CNRS conducted a survey in the seven villages adjacent to Rahimapur forest and identified 83 different species (Table 5.7).

Table 5.7: Species diversity of the villages of Rahimapur Forest

Serial No.	Name of village	Species richness	Species diversity (very low 0 to high 1)	Level of diversity
1	Arshinagar	29	0.121	Moderate
2	Rahimapur	53	0.054	Low
3	Hariharpur	39	0.129	Moderate
4	Sholachura	32	0.143	Moderate
5	Chinamara	22	0.108	Moderate
6	Gopalpur	20	0.182	Moderate
7	Rajapur	31	0.091	Low

(Source: CNRS, 2013)

Faunal Species diversity

Conservation and management of Rahimapur forest also helped to increase the faunal species diversity of that area. In my study area, the forest trees remain inundated for about four to six months during monsoon season and act as extra habitats for aquatic biota, including various fish species. Several smaller mammals and birds use the flooded trees as habitat for nesting, roosting and refuge in this season. According to the respondents, the type and number of wildlife in the forest have been increasing over last few years, including heron, house myna, rat, king fisher, cuckoo, sea-gull, fox, cormorant, kite, eagle, frog, magpie robin, crow, sparrow and common myna (CNRS, 2013). According to a female respondent,

> If you go into the forest, you will hear sound of birds chirping all the time. Both the number and variety of birds have been increased in our village for last couple of years. We see birds like heron, house myna, cuckoo, sparrow in the forest as well as in the village area; which was missing even about five to six years ago.

5.2.4: Financial Capital

As mentioned in Chapter Two, there are two types of financial capital (DFID, 1999). The first type includes assets that people can own such as land, gold, cash money, and other valuable items, and the second type is entitlement to financial services. In rural area, land is considered to be a good and secure form of financial asset for the villagers. Land is mainly used for building houses and agricultural use. In my study area, 94.3% of respondents live in houses on their own land. Apart from land, the other major assets of the communities are domestic animals and a few have savings in bank accounts. My results show that 80% of the respondents had some forms of movable property including land, gold and domestic animals, and 49% of the respondents owned movable property up to 5,000 BDT. A total of 18% of them owned property of 5,000 to 10,000 BDT. 92% of the respondents who had participated in SFRS meetings and training programs owned some form of movable property (Table 5.8).

Table 5.8: Ownership of movable property

Total amount of Movable property (BDT)	Have you attended SFRS meetings and training programs?		Total (%)
	No (%)	Yes (%)	
0	18	2	20
1-5,000	33	16	49
5,001-10,000	15	3	18
10,001-20,000	6	4	10
20,001-40,000	2	0	2
40,001-50,000	1	0	1
Total	75	25	100

Source: Ferdous, F. Rahimapur Forest Field Survey (July-October, 2016)

The other forms of financial capital include access and entitlement to NGOs, micro-credit organizations, CBOs, friends, relatives and local moneylenders for receiving credit or loans. In rural Bangladesh, micro-credit programs are well recognized as an efficient strategy for poverty alleviation through providing financial capital to the people who lack financial sources (Grameen Bank 2009; Roodman and Morduch, 2014). The concept of micro-credit was first introduced in 1976 by the Nobel laureate Professor Muhammad Yunus and his institution, the Grameen Bank (Bonomo & Kirchstein, 2010). During the 1990s, the country experienced a major expansion of micro-credit activities. In the last two and half decades, micro-credit programs have been operated by government organizations and NGOs. Due to the expansion of micro-credit organizations in different parts of the country, it has become easier for the poor to procure credit. Studies have shown that micro-credit programs have generated significant positive impacts in the socio-economic lives of rural Bangladeshi women (Afrin et al., 2010). During the survey in my study area, 84.5% (Table 5.1) of participants were involved with several NGOs, such as the Association for Social Advancement (ASA), Bangladesh Rural Advancement Committee (BRAC) Grameen Bank, and the Voluntary Association for Rural Development (VARD).

5.2.5: Physical Capital

Physical capital refers to the infrastructure of an area. In wetland areas of Bangladesh, seasonal variation has a significant impact in determining the modes of transportation and communication. The project area remains under water for three to four months of the year and boats are the main vehicle for transportation during this time. Though the main roads are paved, the internal rural roads are often inundated and remain in poor condition during the monsoon season. The communities of the project area have good access to schools for education and to local markets for trade and commerce.

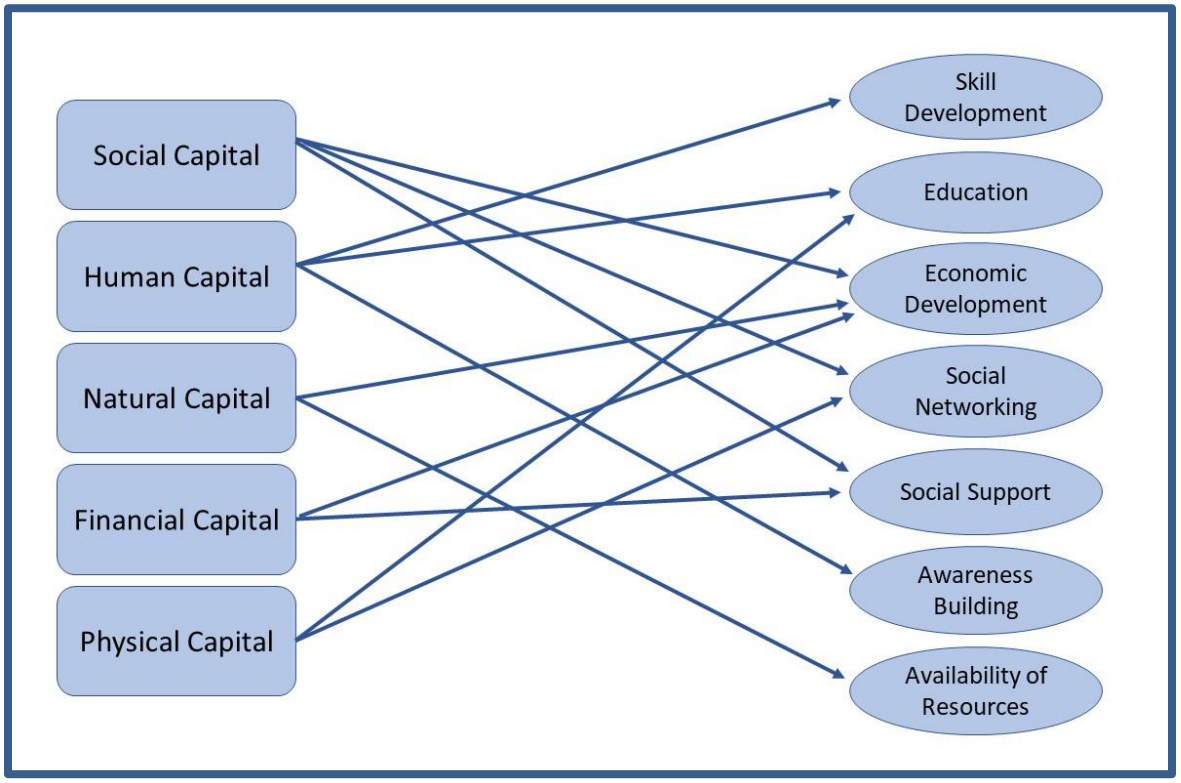
To improve the communication system among CBO members, CNRS and AF constructed a permanent office space (Figure 5.4) with necessary furniture at the project site so that regular meetings can be held by CBO members. This was constructed to help CBO members to discuss the important issues with various stakeholders such as CNRS members, project beneficiaries, local leaders and other advocacy groups during project phases and afterwards.

Figure 5.4: Office Space for CBO Members

(Source: Ferdous, F. 2016)

The following figure illustrates the important elements for managing livelihood activities provided by various capitals under the co-management approach of the SFRS project. The influence of the relationships are determined based on the forest conservation and livelihood management activities of the SFRS project and their impact on local communities. The inferences made are based both on responses of the participants of this research as well as other secondary literature and data sources.

Figure 5.5: Capitals Strengthening the Important Elements of Livelihood Management



(Source: Ferdous, F. Rahimapur Forest, 2016)

5.3: Discussion

The state of co-management under the SFRS project has resulted in a remarkable change both in forest condition and in livelihoods. Participants commented that, in some ways, their livelihoods improved after the intervention of the project as it introduced some AIG activities, provided trainings and built awareness. Some of them commented that their lives are better now in some ways, because they have a reliable organization (i.e. CNRS and the CBO) where they can share their problems and get valuable advice on possible solutions.

Results of KIIs, SSIs, FGDs and the household surveys suggested that the SFRS project initiated forest conservation activities, AIG opportunities as well as capacity building training and awareness programs that affected the livelihoods of local people of Rahimapur forest. Respondents suggested that because of these initiatives, forest offences and illegal activities in the forest area have also declined. In fact, the project leader of SFRS stated "there has been very limited incidents of tree felling within the last seven years, whereas a large number of *Hijol* and *Koroch* trees were cut earlier." Similar results are found in Teknaf Wildlife Sanctuary (Belal, 2013), where the implementation of co-management reduced illegal resource collection and improved livelihoods of the local community by introducing similar activities as the SFRS project. Karim (2008) also found that AIG activities initiated by co-management projects have had significant positive impacts on securing community livelihoods and reducing their dependency on forest resources.

The results of my research showed that participation of different stakeholders in the SFRS project initiated social mobilization and empowerment by building social capital. Community members learned through CBO members by developing a cross-scale institutional linkage with government and non-government organizations, and enriched their mutual understanding and experience about the benefits of group activities (Figure 5.1). The SFRS project thus helped

community members to build their social capital through a process of inclusion with wider networks. Similar results were found in *Hakaluki haor* (Uddin, 2011), where community members acquired the ability to examine and change their management initiatives on the basis of accumulated social knowledge and new information. In Botswana and Cambodia, co-management approaches were found to transform some rural communities from living in a state of poverty and depending on handouts from the government and other donor agencies, into productive communities through building their social capital (Anderson and Mehta, 2013).

AIG activities, training for capacity building and awareness raising meetings had a significant impact on improving the human capital of the communities of Rahimapur forest. A large section of the community experienced a positive change in health and education. Women who adopted AIG activities and were trained for capacity building exhibited positive changes in their lives, such as contributing to the household decision making, ownership of assets and increasing respect in the family. The co-management approach in LNP, SNP and the *Mokosh beel* area presented similar livelihood improvements for the local communities (Chowdhury, 2013; Ferdousi, 2013). This contrasts with the results of some co-management projects in Kenya, which appeared to be structurally flawed and might not have had much impact on the society. The capacity building approach in Kenya was proposed to be refined in order to to focus on the broader context, and the use of scarce resources (Anderson and Mehta, 2013).

The SFRS project contributed to managing the natural capital of Rahimapur forest. During the first two phases, the SFRS project covered 13.8 hectares of Rahimapur forest area with 20,700 saplings of *Hijol* and *Koroch* trees. A few other species (such as *Rain tree*, *Kodom* and *Arjun*) were also planted in the forest, which subsequently showed 82% survivability. A similar plantation initiative has also been seen under the co-management approach of the MACH project, where a

total of 605,365 saplings of 56 species were planted, including 48 native and 8 domesticated exotic species. These actions restored 21% of the flooded forest (Sherwood, 2009). There are other examples of the conservation of natural resources in LNP (Haider and Kabir, 2014), (Uddin and Hassan, 2010) and SNP (Chowdhury, 2013) in Bangladesh and in Guatemala, Cambodia and Kenya (Anderson and Mehta, 2013). In Botswana, the co-management approach was found to conserve biodiversity by keeping national wildlife population levels and trends stable for most species, while increasing numbers of steenbok, impala and elephant numbers by up to 5% since 1987 (Arntzen et al., 2003). According to Anderson and Mehta (2013), successful management is less likely to be transformational when the co-management approach is implemented for only a section of the natural capital portfolio, as it accounts for a minority share. For example, in the case of a co-management project in Kenya, the community based management of forest resources could not contribute significantly to economic well-being as the most important part of the portfolio was agriculture (Anderson and Mehta, 2013).

Natural resources (i.e. natural capital) can retrieve and regain their value fairly quickly through proper management and the implementation of co-management principles. That is why forest resources in Nepal and wildlife in Namibia have become crucial parts of the rural portfolio since these resources recovered and became more productive (Anderson and Mehta, 2013). Rahimapur forest, under the appropriate conservation and co-management approach of the SFRS project, recovered quickly and started providing important ecosystem services to the people of the area.

5.4: Conclusion

The SFRS project initiated capacity building activities (such as training, meetings and other advocacy programs), helped the beneficiaries to develop their skills and knowledge and helped

them build their social network by engaging with NGOs, government organizations and local formal and informal institutions. Such activities helped the beneficiaries to build their social and human capital. Several women were found to be engaged with various project activities, which was an indicator of livelihood improvement. The community members were aware of the importance of forest conservation and thereby were engaged in homestead plantation of various species including fruit trees, wooden trees and other fast growing species that are helpful for their day to day use and for livelihood management.

Chapter 6: Views of Various Actors concerning the SFRS Project: Community Members vs. Managers' Perspectives

6.1: Introduction

This chapter attempts to provide a detailed understanding of how the SFRS project has impacted the way local communities use and derive benefits from forest resources. This chapter starts with an assessment of how the SFRS project has limited the access of community members to forest resources and how this restriction has impacted local poor community members. It also examines: the extent of the participation of local communities in the project; its impacts on the project sustainability as well as on the society; and the stakeholders' views of the SFRS project and the co-management approach. Finally, their beliefs, major concerns and positions regarding the present and future of SFRS project activities are analyzed.

6.2: Nature of Restriction on Using Forest Resources by SFRS Project

According to the theory of access (Ribot and Peluso, 2003), the term "access" is defined as the ability to derive benefit from things. However, in the literature, access is often used to include property rights and other ways of getting benefits from resources (Newell, 2000). Ribot & Peluso (2003) distinguished "property" by defining it as "the right to benefit from things." Following this definition, access is more similar to a "bundle of powers" than to property's concept of a "bundle of rights." (Ribot and Peluso, 2003, P: 153). Schlager and Ostrom (1992) proposed five types of rights: i) *entry*, the right to enter a defined physical area, ii) *withdrawal*, the right to use the products of a resource, iii) *management*, the right to regulate internal use patterns, iv) *exclusion*, the right to determine who can access/participate, and, v) *alienation*, the right to either sell or lease. The first two types of rights are rights at an individual level, while the last three types are at the collective-choice level (Schlager & Ostrom, 1992). For this study, management, withdrawal and exclusion rights are the most relevant and therefore are the focus of discussion. In this section, I

will briefly discuss how the introduction of the SFRS project has limited local communities' access and rights to use forest resources. The investigation is guided by two basic questions: i) what benefits did local communities derive from Rahimapur forest during, before and throughout the SFRS project?, and, ii) what kind of access did the community members avail?

Under the formal system, flooded forests were considered a means of revenue for the government. The Ministry of Land leased out flooded forest, *haors* (low lying, bowl shaped flood plain), *baors* (oxbow lakes, formed by dead arms of rivers), rivers, and *beels* (perennial water bodies), for a three to five year period, through an open bidding system that favoured the highest bidder. Local rich people or politically powerful leaders or their agents are usually chosen as leaseholders. Once the forest is leased out, local communities are not allowed to exercise their customary rights. Sometimes local people therefore migrate to cities or other places to find jobs and to cope with the situation. Before the intervention of the SFRS project, Rahimapur forest was also leased out to local leaseholders and the communities were not legally permitted to use forest resources. However, the poor villagers often practiced illegal activities in the forest such as cattle grazing and the collection of firewood, non-timber forest products, a semi-woody shrub named *Ipomoea carnea* (Local name: Dhol kolmi) that is used as fuel for cooking and tree branches for brush piles for fishing. However, the intervention of the SFRS project in 2009 has banned almost all such illegal activities of forest resource use by the community members.

According to rules and regulations set by the SFRS project, all the community members are excluded from using forest resources with a few exceptions. The data illustrates that under the project, a few poor households in the area were being allowed to collect tree leaves from the forest. Collection of leaves was allowed for poor households (predominantly women) who considered it expensive to buy firewood from the market. They were also allowed to collect Dhol kolmi

(*Ipomoea carnea*) to use as fuel. However, their access to the forest and collection of resources were closely monitored by CBO members. All the other community members were strictly prohibited to extract any resources from the forest. The nature of restrictions on various types of resource uses, set by the SFRS project, is shown in Table 6.1.

Table 6.1. Nature of restriction in using forest resources

Types of uses	**Permitted/Prohibited**
Vegetables and wild food collectors	Access Prohibited
Fuel wood collectors	Access Prohibited
Animal grazing	Access Prohibited
Access to forest for brush pile (*Kaata*)	Access Prohibited
Access to forest for Dhol kolmi (*Ipomoea carnea*)	No specific regulations
Access to forest for tree leaves	No specific regulations

(Source: Ferdous, F. Rahimapur Forest Field Survey, 2016)

The findings of this study illustrate that under the SFRS project, the rules for forest resource use were more strictly enforced compared to the previous period of leasing out. Though during the leasing period there were fines of up to 10,000 BDT or up to 6 months in prison for use of forest resources, there was no regular patrolling by lease holders or forest guards. According to some respondents, the main focus of leaseholders was revenue earning rather than forest conservation. Such lack of attention of leaseholders gave the opportunity to local users to perform illicit activities in the forest. After the commencement of the SFRS project, the CBO, CNRS members and local forest guards paid regular visits to the forest to protect the resources, which made it difficult for the villagers to perform any illegal activities in the forest. Moreover, punishment for illegal activities includes penalties from 500 BDT to 20,000 BDT or 6 months to 2 years of imprisonment.

However, some of the villagers considered the penalties determined by the SFRS project to be excessively high. According to a participant:

> SFRS project has set some strict rules, even for fuel wood collection. It is hard for some of us because we used to collect fuel wood from the forest from time to time. Since some of us in this village are very poor and can't afford to pay for fuel wood every month, we may steal and be charged in court and our families will suffer for that.

The SFRS project has played a significant role in resource management of Rahimapur forest by facilitating or constraining local resource users' access to, use and control over resources. The project, by initiating community-based management, gave the ownership to local resource users to manage their own forest. However, it has restricted their scope of resource extraction, which otherwise was a common activity for some community members. The project has thus changed the rights described by Schlager and Ostrom (1992) through the active participation of stakeholders in forest management. For example, the forest is now being managed jointly by project managers (AF and CNRS representatives) and local communities, i.e. management; forest tree leaves and Dhol kolmi (*Ipomoea carnea*) are allowed to be collected by local poor community members, i.e. withdrawal; and only PIC and CBO members have the right to join in participatory forest management activities, i.e. exclusion. Even though all the beneficiaries and CBO members have ownership in the forest, they are controlled by project managers regarding access and rights for resource extraction.

6.2.1: Impact of Restriction on Communities' Livelihood Activities

As stated above, communities living around the flooded forest supported their livelihood largely through being involved in diverse activities and trades related to forest resources, such as animal grazing and fuel wood collecting. When asked about how the SFRS project's forest management

system was helping them to improve their livelihood, although a section of the community provided positive feedback (as mentioned in Chapter Five), a number of community members indicated that under the current management system they had hard times maintaining their families. Most of the households that were highly dependent on forest resources were the families of day laborers whose male members worked as immigrant worker in cities. They believe that access to forest resources to a certain extent should be allowed by the forest managers (i.e. CNRS members). It was found from the field data and information provided by the users that the current management system of restricting access and rights to resources affected them in various ways. Some of them adopted different income generating activities, and a few others have moved to the cities as immigrant workers. When a large number of poor people need to use the forest resources for livelihood, it can easily be understood that limiting access rights adversely affects the livelihood of the community. The following words of a female member reflected the suffering of the poor in the community:

> Most of the household heads of this village are day laborers and they work in the cities. So it is hard for us to go to the market for buying firewood, and they are expensive as well. We used to go to the forest for collecting tree branches but now we are not allowed to do that. We heard that they (CNRS and CBO members) will take legal actions if they find us cutting tree branches. Where would we go then?

While discussing the issue of limiting communities' access to forest resources with the CNRS members, they revealed that their major focus was to conserve the forest and therefore to engage the community members with various AIG activities so that they can manage their livelihood without using forest resources. According to CNRS members, there was no practice of homestead gardening in this area. Under the SFRS project, CNRS members introduced these practices by providing local communities seeds and seedlings of various species for vegetable

gardening, saplings of several fruit trees and economically and medicinally important trees. Community members have also been given training on vegetable gardening, grafting techniques, seed preservation, seedling production and sapling and nursery management (as discussed in Chapter Four). According to a CNRS member:

Since a large section of the community members are poor, they will try to use forest resources, either legally or illegally. But if we don't protect the forest by limiting their access to forest resources, we will not be able to conserve this forest. Allowing community's access to forest resources will degrade the forest beyond restoration. Therefore, we are trying our best to engage the community with different AIG activities.

According to the Chairperson of AF:

> We try to improve livelihood so that the community takes interest in conserving forest. That is our strategy. Because if we just go for forest conservation, it will not work. So we try to reduce people's dependency on forest by engaging them in other income generating activities.

According to the Deputy Commissioner of Sunamganj:

> At the beginning of the project the government hoped the project would be a major tool for upgrading the living standard of the poor people of hoar area of Bangladesh. I think the expectation is being fulfilled slowly.

It was found that a majority of beneficiaries (52.6%) did not receive any training on vegetable gardening from the SFRS project. The remaining beneficiaries received the opportunity of obtaining training on vegetable gardening and some of them managed to grow a homestead garden successfully. Therefore, some of the community members were not satisfied with the CBO

members for not engaging them in activities. It was also found that a few community members who were trained were unable to implement their knowledge and skill to improve their livelihood for various reasons. These included flooding and lack of land ownership for homestead gardening. The following quotes explain the condition of poor families:

> Though I got seeds and saplings from CNRS, I was not able to start vegetable gardening as I have a very limited space in my house yard. I have seen CBO and a few other members to produce vegetables and sometimes sell in the market as well. But I was not able to take that opportunity provided by the SFRS project.

> I was trained on vegetable gardening, and also produced several vegetables and made some money by selling vegetables in the market during the initial years of the project. But the vegetable plants were dying for the last two years due to early flood. That is why I have stopped producing vegetable this year as I cannot afford to lose money this way anymore.

Therefore, all community members' needs were not adequately fulfilled by the AIG activities of the project. As well, the training provided by the SFRS project was insufficient for the community members. Community members could not use all the AIG activities successfully, thereby reducing their reliance on CNRS members and the project's sustainability. As a consequence, when asking about the possibility of the project to secure communities' livelihoods, a section of the respondents (23%) felt that the probability is low. However, 58% of respondents thought that there is a moderate probability that the project could secure their livelihoods and 17% of respondents thought that there was a high probability (Table 6.2).

Table 6.2: Views of community members on probability of SFRS project to secure community's livelihood

Movable property (BDT)	To what extent do you think this project is likely to secure your livelihood?					Total (%)
	Very low (%)	Low (%)	Moderate (%)	High (%)	Very High(%)	
0	1	4	12	3	0	20
1-5000	0	16	32	1	0	49
5001-10000	0	2	8	7	1	18
10001-20000	0	0	6	4	0	10
20001-40000	0	1	0	1	0	2
40001-50000	0	0	0	1	0	1
Total	**1**	**23**	**58**	**17**	**1**	**100**

(Source: Ferdous, F. Rahimapur Forest Field Survey, July-August, 2016)

To understand communities' responses towards the project, I examined the amount of movable property as an indicator of their economic condition. I found that most of the respondents (64%) who felt the project has a low or moderate possibility of securing their livelihood are poor (as they have no assets or assets worth less than 5000 BDT). 18% of respondents felt the project has a substantial possibility to secure their livelihood, and 14% of them possessed movable assets worth more than 5000 BDT. It can be said since most of the respondents are poor, they might have a lower tolerance level and dependence on the project.

6.3 The Extent of Stakeholder Participation in the SFRS Project

Stakeholder participation is known to be a critical aspect of sustainable forest management (Sheppard and Achiam, 2004). In this chapter, the term "participation" is defined as a process in which individuals, groups, and organizations prefer to participate in making decisions that affect them (Wilcox, 2003). According to the World Bank's definition, participation is "a process through which stakeholders influence and share control over development initiatives and the

decisions and resources which affect them" (World Bank, 1996, P: 3). The focus here is on the extent of stakeholder participation; I will be investigating the degree to which the stakeholders (i.e. the beneficiaries) and other community members have supported and participated in the activities of the SFRS project.

During the first year of the project, CNRS organized meetings, FGDs, KIIs, and household surveys in all adjacent villages, and selected 200 beneficiaries on the basis of criteria including: occupation, education, number of family members, earning members and amount of land (details are discussed in chapter four). Groups like the CBO and PIC were also formed by CNRS to accelerate the SFRS project activities with the active participation of local communities. CNRS arranged monthly meetings with the villagers as well as organized various training programs for them. However, it was not possible to train all beneficiaries due to various constraints (such as time, budget and willingness of beneficiaries), and participants were selected for specific programs. For example, mostly women were encouraged for training in vegetable gardening and farmers were given training on grafting techniques, seed preservation and management, whereas training on flooded forest management was given to all CBO members and other beneficiaries, including both males and females. Data collected from the respondents revealed that initially, CBO and PIC members and a group of other beneficiaries who attended the monthly meetings regularly, were found to be present throughout the training programs on a regular basis. However, CNRS members also wanted to work with the interested community members who realized the importance of the flooded forest and would participate voluntarily in conservation and management of the forest.

> "It is not possible for us to bring people from their houses. He/she who is interested will be included in the project automatically. We cannot force anyone to attend the meetings and

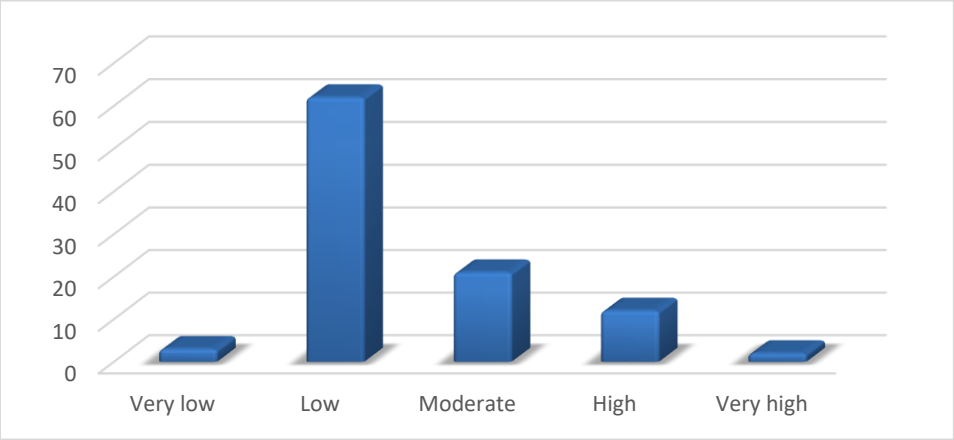
> training programs. What we can do is to try to make them realize the importance of the flooded forest conservation and management and train them and build their capacity. (A CNRS member, SFRS project)

Therefore, a group of selected members evolved with a fixed set of participants who attended the meetings and training programs regularly, whereas some of the other community members felt themselves to be "outsiders". This process led the community members to feel that there was a bias in the selection of users for plantation of the forest. It was alleged by some community members that a few members were preferred and repeatedly invited, while a large majority of the members remained unheard. The community members were also divided on opinions regarding the beneficiary selection process, although beneficiaries were selected following a systematic procedure by CNRS. A few members felt that they were poor enough to be included in the list of beneficiaries and to get the benefits from the project. However, a section of the community members had a strong feeling of dissatisfaction and annoyance towards CNRS members. They believed that CNRS members only chose participants who were not knowledgeable enough and would blindly support all of their activities under the SFRS project. It was found from the KIIs and SSIs that the respondents holding negative attitudes towards the SFRS project were mostly non-beneficiaries. Since most of the community members were poor in the project area, it is apparent that they felt pain and anger while only some community members received some kind of benefit (such as AIG activities and training on capacity building).

The level of connections community members shared with the SFRS project is shown in figure 6.1. A majority of the community members (62%) considered that they had a low level of engagement with the project, and 3% of people thought that their engagement with the project was very low. Only 12% felt a strong bond with the project and 21% had a moderate level of

involvement with the project. While investigating the low level of engagement of community members in spite of project initiatives, participants responded that the project has reduced activities since the end of the second phase. No more community meetings had been organized for the past couple of years. Therefore, communities' engagement with the project has also been reduced.

Figure 6.1: Level of engagement of participants with SFRS project



(Source: Ferdous, F. Rahimapur Forest Field Survey, 2016)

While discussing the same issue with CNRS members, they stated that the project was coming to its end and the activities were drawing fewer participants than in earlier years. As a result, no regular monthly meetings or awareness raising activities were being arranged with the community members. The CBO members were handling the project activities and a few participants were assigned to control communities' access to the forest. Therefore, a temporary gap is occurring between CNRS members and local community. Such incidents might have led some people to be excluded from the project and to hold a feeling of annoyance towards the project and CNRS members. These emerging features would eventually hinder the progress of the project.

6.3.1: Reasons for Limited Stakeholder Participation

The efforts of the SFRS project activities were limited by several factors. These included lack of coordination between CNRS and local villagers, a benefit sharing mechanism that was unclear to the beneficiaries and the exclusion of some community members from the project. Some of these reasons are discussed below.

6.3.1.1: Communication Gap between CNRS and Local Villagers

Many participants indicated that there was insufficient communication between the local villagers and CNRS members. It was a responsibility of the CBO and CNRS members to let the community know the rules and regulations of the SFRS project and of accessing the forest resources. For example, many poor villagers were still unaware of their legal access to the forest for tree leaves and *Ipomoea carnea* (Dhol kolmi). Participants informed me that due to ignorance about such rules, many users failed to gain legitimate access to resources of the forest. On the other hand, being unaware about these rules sometimes compelled them to illegally use forest resources, such as cutting trees or tree branches. Since the villagers were frightened that their access to the forest might cause legal actions against them, they tried to use the resources in a secret way. One of the beneficiaries' comments, which conformed with the general views, was that:

> We never use any resources from the forest, though it is very hard for us to maintain our livelihoods without using forest resources. We came to know that the forest has been taken by Government people (i.e. CNRS) and they will take legal actions against us if we are caught red handed in using resources from the forest.

According to the CBO members, due to the lack of education and awareness, many users were less concerned about their rights. As a result, they were unable to get legal access rights to the forest and accrue benefits from the resources. When CNRS members were asked about this

issue, they responded that open access to the forest might cause excessive extraction of forest resources leading the forest to go back to its previous degraded condition. That is why they allowed only limited access of poor people to the forest, only for tree leaves and Dhol kolmi *(Ipomoea carnea).* Therefore, insufficient dialogue and negotiations between the CNRS and community members was evident. According to Berger and Craig (2002), dialogue and negotiation with the stakeholders of a program are the main factors in resolving conflict and progressing the evaluation. In my study area, participants also revealed that community members expected the CNRS and CBO members to keep them updated about their project activities. They expected CBO members to pay regular visits to their households to know about their livelihood needs and various other issues. In this respect a respondent stated:

> During the initial days of the SFRS project, CNRS members sometimes came to us to ask if we have any problem regarding livelihood activities but they do not visit us now. Monthly meetings are not being organized anymore. Many villagers are not educated and they are often afraid talking to CNRS members about livelihood issues. If we could see them often then we would not have any problem sharing our problems with them.

However, some of the beneficiaries said that even though they had received less support from CNRS members in the last few years, their previous experiences with them during the first two phases of the project were satisfactory. In addition, participants also reported several other issues that they thought were the result of users' limited participation in the project. One such issue was limited attention by CNRS members on developing livelihood opportunities other than conserving and restoring the forest. According to the participants, people living in the wetlands depend on forest resources for their survival. In order to conserve the forest resources, it is therefore important to provide enough AIG sources to the community members. Participants

mentioned that CNRS-initiated AIG activities (as mentioned in chapter four and five) were not sufficient for all the local community members.

6.3.1.2: Accidental Exclusion of some Community Members

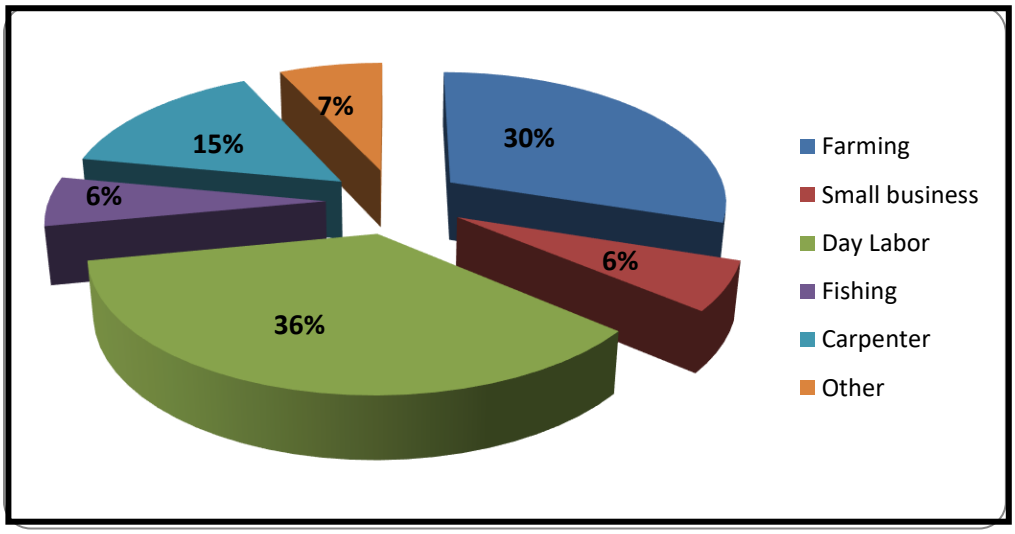
There is always a risk of excluding some stakeholders accidentally, and as a result it is often difficult to find the relevant stakeholders (Clarkson, 1995). Clarke and Clegg (1998) stated that it is hardly possible to include all stakeholders, and a line should be made at some point, depending on some criteria established by the research analyst. Who will be included/excluded from a project depends on the method of stakeholder identification and the purpose of stakeholder analysis (Mitchell et al., 1997). Bryson et al., (2002) stated that for the purpose of social justice, it is crucial to have an inclusive view of stakeholders, since the "nominally powerless" must be allowed to express their voices.

Data from various CNRS reports revealed that several KIIs, FGDs and group meetings were held by CNRS with fishers, farmers, carpenters and women's groups to inform them about the project objectives, initiatives and activities. The process helped CNRS members to build a relationship with the local community. CNRS members conceived that almost all members of the community, including fishers, farmers, carpenters and small businessmen were present during 48 community meetings, where they discussed various alternative livelihood sources, the importance of the flooded forest and its conservation and management.

However, data collected from Rahimapur forest communities indicated that about 36% of the household heads were day labourers who worked in cities as immigrant workers (Figure 6.2). The majority of them did not get the opportunity to attend meetings and training programs arranged by CNRS. Moreover, female members of these families expressed that it was not always possible

for them to attend the meetings and training programs since the male members of the families were away from home. Therefore, these families had limited interactions with the project as they did not participate actively with the activities of the project. Such accidental exclusion might have had negative impacts on the project since all the relevant stakeholders were not directly involved with it.

Figure 6.2: Primary occupations of the community members at the project site



(Source: Ferdous, F. Rahimapur Forest Field Survey, 2016)

6.3.1.3: Limited Knowledge of Beneficiaries about the Benefit Sharing Mechanism

According to CNRS reports, beneficiaries of the SFRS project were selected on the basis of : occupation, education, number of family members, earning family members and their amount of land, which was collected from household surveys as well as monthly meetings, FGDs and KIIs. Except for the CBO members, most of the community members had limited understanding of the benefit sharing system of the SFRS project. A large part of the community members did not know if their name was included on the beneficiary list. A clear understanding about the benefit sharing mechanism and the possible incentives of the project would have engaged them more with the

project and would have also increased their awareness of conservation and restoration of the forest. Islam et al., (2011) suggest that a fair benefit sharing mechanism is crucial for motivating local people in participatory forest management in Bangladesh. Therefore, the idea of a benefit sharing approach should be completely transparent to all stakeholders to influence conservation and management of natural resources and also to accelerate people's participation in a participatory project.

6.4: Implications of Limited Participation of Community Members

According to Ashley and Roe (1998), active participation of stakeholders is crucial in planning, implementation and management of a protected area for various reasons. Most scholars explain participation as a process in which local people take part in each and every step of development, according to the guidance of a developer who is an outsider. Local community participation is considered the most essential element influencing co-management activities (Patwary, 2008).

In my study area, a number of respondents mentioned that local communities had limited scope for participation with the project. Community members often were not aware of many forest management activities such as: afforestation programs in the forest area, planting various flooded trees and the introduction of new species at the homestead level. Hence, the community at large did not have adequate and authentic information about the actual activities of the project.

6.4.1: Impacts on Project Sustainability

Sustainability is a goal that is achieved through modern kinds of governance and decision-making processes engaging various types of stakeholders (Loorbach and Rotmans, 2006). Stakeholder engagement hence plays a significant role in the process of project sustainability. The importance of engaging stakeholders in the decision-making processes of a project is also associated with

increasing their sense of project ownership (Shindler and Cheek, 1999). The Chairperson of AF expressed the importance of building this sense of ownership in the local communities in the following words:

> We do not want to make them (i.e. the community members) beggars, rather we try to develop a sense of ownership in them (the community members) about the project. We make them realize that it is (SFRS project) their project, they are doing it, they are conserving and managing the forest. We build their organizational and institutional capacity and help them providing alternative livelihood activities. We try to make them self-dependent. That is what we do. (Farid Uddin Ahmed, Chairperson, Arannayk Foundation)

Project ownership refers to the responsibility that accelerates project activities towards their objectives. Participatory projects generally are more successful when the community takes over the ownership of the project (Otieno, 2007). Engaging local people in the development of plans and activities of a project helps build this sense of ownership among community members (Alam and Ihsan, 2012). According to Chambers (1994), engaging local people with a project is a continuous process in which negotiation and decision making occur with all stakeholders at various stages of the project.

Local participation is considered one of the key elements of project sustainability. In the context of my study area, participants stated that project activities were never discussed with them. Data collected from the respondents revealed that only CBO and CNRS members had the power to take any decisions regarding project activities. The communities hence remained weakly connected with the project, which was an obstacle to building the required friendly relationships between forest managers and local communities. This was crucial for the long term sustainability of this participatory project. In this context, Kolahi et al., (2013) stated that one of the main reasons

for unsuccessful management approaches is failures in building connections with local people. According to Haider and Kabir (2014), the major complaint of the stakeholders of the IPAC project was the non-cooperative nature of the co-management committee. They also claimed that communication gaps between VCFs, the co-management committee and local villagers were also responsible for the unsuccessful conservation approaches.

6.4.2: Impact on Society

The current management approach is providing a mix of positive and negative impacts on the society at large. During the time of my survey, CBO members were leading this project and all the facilities were being maintained by them. They attended several training programs, including flooded forest management, systematic harvesting of forest trees, and vegetable gardening. These training programs helped them strengthen and develop their skills, abilities and their organizational capacity. However, other participants did not receive all these training opportunities.

During a FGD, while one of the beneficiaries was sharing her learning experience at training, some other female members were disappointed for not getting the same of training. They felt that sometimes only CBO members and a few beneficiaries get the chance to take advantage of the opportunities provided by the SFRS project. For example, a limited number of improved cook stoves were provided by the SFRS project to the beneficiaries. Priority was given to the CBO members to take the stoves first and the rest of the stoves were distributed to some other beneficiaries selected by the CBO. While talking about this issue, A CBO member said that,

> We have a good idea about the economic condition of the community members and therefore, it is easier for us to decide who needs the product most. We discuss this issue with all the CBO members and then select the beneficiaries.

However, some participants disagreed regarding this perspective of CBO members. They felt that even though all beneficiaries were treated equally in some SFRS-initiated activities (for example, distribution of vegetable seeds and saplings, fruit tree saplings), the treatment was not equal in other cases. The poor families, who were actually dependent on forest resources, sometimes were left behind from receiving project benefits.

Women heads of families were either widows or divorced. It was hard for them to live in such conditions when they had limited access to the forest resources. Moreover, household heads of many families worked as day labourers in cities. The female members of these families also felt a gap in the project, which caused them to suffer from not obtaining benefits from the project. A female participant shared this in the following words:

> My husband works in cities as a day labour and I have my household responsibilities to perform. It is not possible for me to be updated about the project activities all the time. Lack of information and communication often make us deprived of getting important benefits like improved cook stoves.

Some of the community members held a belief that CBO members were making maximum benefits from the project. CBO members had a 20% share of the benefits from the project. They also saved a fund of 40,900 BDT, which they used to invest in loans within the CBO members (CNRS, 2013). Most of them attended all training programs on organizational and leadership development, forest conservation and management and planning and organizational capacity development. Sometimes, the strong leadership of CBO members gave the others a feeling of being lower in status or quality, which often resulted in creating tensions in the society. This leadership attitude gave them the right to blame others for forest destruction and the legal authorization to make decisions regarding forest management. These situations were sources of conflict between

the CBO and other community members, and might have hindered the progress of the project in the long run.

6.5: View of Local Community Members and Forest Managers regarding the SFRS Project

The opinions and perspectives of all the stakeholders in the project area were examined to better understand their attitudes toward participation in forest management, experience and beliefs about SFRS project activities and perceptions of the role of forest managers. Three categories of respondents were thought to be relevant to these issues and thematic areas:

- CBO and project beneficiaries
- Local community members
- Forest managers (AF and CNRS members)

6.5.1: Perspective of CBO and the Direct Beneficiaries

When the CBO and other beneficiaries were asked how much they learned about systematic management of the flooded forest, 70% of respondents expressed that the meetings and training programs were very useful for them to understand and learn about flooded forest conservation and management and the systematic harvesting of flooded trees. Consequently, CBO members managed to generate a fund in order to strengthen sustainable forest management activities, even after the completion of the SFRS project. They believed that it would strengthen their capability to run the project smoothly during and after the SFRS project period. CBO members admitted that the communication methods used to keep the public informed about land use planning processes needed further improvement. One specific benefit to the CBO members was that they became well connected with all the community members of the project area. This helped them to implement activities regarding forest conservation and management.

CBO members had good connections with several government organizations, NGOs and various stakeholders of other flooded forest restoration projects. Association with all these organizations helped the CBO to carry out project activities. CBO members' overall satisfaction with the management of forest resources was high. They had a strong and healthy relationship with AF and CNRS members. They also felt a close connection with the Rahimapur flooded forest since they had been conserving and managing the forest since 2009. Female respondents specifically expressed that they had developed an emotional attachment with the forest and taking care of the trees was as a spiritual fulfillment for them.

6.5.2: Perspective of local community members

The local community members generally believe that the SFRS project was a successful endeavour in conserving the once degraded forest. There was a growing realization among the community members that even though the SFRS project had moderate success in livelihood improvement, it was necessary to protect the Rahimapur flooded forest for present and future generations. When the participants were asked about the extent they thought this project would be beneficial for conserving forest resources, 73% perceived that there was a high probability that the project would be helpful in conserving the forest. However, some of the community members stated that the project needed to focus more on sustainable forest management rather than preserving and closing the forest. This section of the members felt that that the conservation program should occur, but it was also important to be beneficial for the local people. As one female participant explained:

> We want the forest managers to conserve the forest resources. But they should also keep in mind that we, the poor people, are dependent on the forest resources, specially for firewood. They should make a rule so that we can collect a limited amount of firewood from the forest. Otherwise, local people will try to do illegal activities in the forest.

Regarding the project activities, many participants opined that there were deficiencies in flows of information, communication gaps between CNRS and community members and limited initiative in engaging local people with the project. An overwhelming majority of the local participants expressed their frustration in that insufficient training programs were organized on nursery establishment, grafting techniques, seed preservation, seedling production, sapling management and sustainable management, conservation and systematic harvesting processes. Respondents' overall satisfaction with project activities was "moderate," and some community members felt that they had limited and weaker social ties with the SFRS project.

6.5.3: Perspective of Forest Managers (AF and CNRS members)

The forest managers believed that the overall performance of the SFRS project's implementation of the project activities was satisfactory. In their discussion on the concept of conserving natural capital, respondents expressed that the project made significant impacts on forest conservation and restoration by conserving the old trees, planting new trees and introducing new species in the forest. In their view, the project also contributed to biodiversity conservation at the homestead level in the project area, particularly by engaging the communities in planting timber and non-timber species, various medicinally and economically important plants, *Murta* and cane.

The respondents explained how the project played a positive role in forest conservation by diverting the resource-dependent poor to AIG activities, such as vegetable cultivation on their homesteads, cattle rearing, poultry farming, fishing, duck rearing and small business. The SFRS project also involved women through several income generating activities, such as homestead gardening and nursery plantation. The CNRS members believed that engaging women in such activities helped them in contributing to household income, which eventually increased respect and may have reduced violence against women in their family.

The respondents explained how CBO members and other beneficiaries were provided with technical capacity building training on organizational development, account management, nursery establishment, grafting techniques, seed preservation, seedling production, sapling management, sustainable management and conservation and systematic harvesting process. Simultaneously, it helped the community members to build human capital in the form of acquired knowledge and skills, conservation and management techniques and positive attitudes. They believed that this human capital subsequently strengthened social capital, building social norms, networks of reciprocity and exchange and relationships of mutual dependence and trust that motivated people to work together as CBO and CNRS members performed monthly meetings and other group activities. Therefore, the SFRS project created the scope for collective action and knowledge sharing, and thus made significant contributions to poverty alleviation through community-based forest management.

6.5.4: Major Concerns of Local Communities

The local community members felt that CNRS and CBO members should strengthen their association with them since a lack of close communication would isolate participants from the project. As a result, a state of opposition might be created among isolated participants, the CBO and other community members, which would result in conflicts in the future. Community members suggested that having clear communication could help ameliorate this fear. They also felt that more income generating activities and training programs should be designed and implemented in order to build capacity in the communities.

An overwhelming majority of the key informant and focus group participants expressed that Rahimapur Forest should be managed by CBO members under the close supervision and monitoring of CNRS members. However, they strongly felt that access to the forest resources

should be allowed for community members under the supervision of forest managers (i.e. CNRS members) so that the communities could use the forest resources in a sustainable manner.

6.5.5: Major Concerns of Forest Managers (AF and CNRS members)

Forest managers expressed great concern about the SFRS project's future since their major activities were accomplished by September, 2017, and since then it is the CBO who is responsible for future activities. They believe that the project's success will depend on the capability of the CBO members to execute the unaccomplished activities of the project, which include regular monitoring of the forest, communicating with other stakeholders and most importantly harvesting mature forest trees when the project will expire and sharing the benefits among all the stakeholders.

The CNRS members will continue monitoring their activities on a monthly basis. Until the CBO members achieve a satisfactory level of institutional development and management competence, CNRS should have some degree of control over CBO activities. They suggest the CBO members maintain a strong social network with community members. To keep the community engaged with the project, the CBO should keep organizing promotional activities, including meetings and workshops with communities, special day observations, bill boards, posters and leaflets with appropriate messages, etc. The CBO should pay frequent visits to community households in order to motivate them in different income generating activities. They also feel that an effective multi-stakeholder partnership should be created by CBO members to organize and implement plans regarding Rahimapur forest. CNRS members are concerned about how CBO members will manage conflict in the community.

Table 6.2: Perspectives of forest managers, CBO, project beneficiaries and local community members

Issues	Perspective of forest managers	Perspective of CBO and Project Beneficiaries	Perspectives of local people	Gaps in knowledge and perception
Conservation of Rahimapur forest	The project has made significant impact on forest conservation and restoration by conserving the old trees, planting new trees and introducing new species in the forest.	The project has contributed in forest conservation and restoration through several afforestation programs.	The project has been successful in conserving the once degraded forest.	All the stakeholders have agreed that the once degraded flooded forest has been restored by the project.
Training and capacity building activities	Through the training and advocacy programs for developing management capacities, beneficiaries were capable of carrying out their own analysis to decide upon strategies for overcoming problems regarding livelihood issues.	Although training and advocacy programs were a strong base for developing management capacities, capacity building was a slow process, because of lack of managerial capacities and large number of beneficiaries.	CBO members and a number of beneficiaries were involved in training and advocacy programs, ignoring a large number of community members.	Training on capacity building and advocacy programs were only organized for CBO and a number of selected beneficiaries. The project members admitted that due to limited budget, they could not afford to arrange training for all the beneficiaries as well as other community members in the local area.
AIG opportunities	The opportunities of alternative income generating activities contributed the community members to be able to actively participate in	Beneficiaries were involved through several income generating activities such as homestead gardening, nursery plantation by making them capable of household income.	SFRS project has paid little attention in developing AIG activities, by only focusing on forest conservation and management. Therefore, AIG activities were not	The project introduced several AIG activities such as, seed and seedling distribution for homestead gardening, nursery plantation opportunities, employment in forest patrolling. However, lack of knowledge, natural hazards and other issues have limited the

	the forest conservation by giving them enough income that reduced their dependency on forest for periods to let the resources recover.		sufficient for the community members.	community members to successfully adopt AIG activities.
Community participation	CNRS and CBO members have successfully participated with the community members throughout the project activities.	CNRS and CBO members have a strong and healthy relationship with the community members of the project area.	Though CNRS and CBO members are less supportive in the last few years, their previous performance with community members during the first two phases of the project was satisfactory.	During the first two phases of the project, beneficiaries and other community members along with CBO and PIC members, participated in different project activities. The number of project activities has been reduced since the project has come to an end in 2019. Moreover, no monthly meetings and group meetings are held anymore. Therefore, the local people are feeling a sense of communication gap with the project.
Future of Rahimapur forest	To ensure sustainable forest management, Rahimapur forest should be managed by the local people. Otherwise it might return to its previous condition.	CBO members, under the guidance of CNRS representatives, have been managing the Rahimapur forest since 2009. They have relevant skill, knowledge and experience of flooded forest management.	Forest should be managed by community members, however, there should some level of access to resource for poor community members.	All the stakeholders have the similar view regarding the future of Rahimapur forest. They think the forest should be managed following community based management program. However, local poor members suggest that there should

		To prevent degradation of this forest, it should be managed by local community members.		be an opportunity for them to use resources in a sustainable manner.

(Source: Ferdous, F. Rahimapur Forest Field Survey, July-October, 2016)

6.6: Discussion

The results of my research suggest that the implementation of the SFRS project in Rahimapur forest has changed the way local communities use and benefit from the forest. On the positive side, the SFRS project has introduced new opportunities for AIG activities and benefits. Some of the project benefits and AIG activities were limited to some selected beneficiaries (such as ICS distribution, nursery plantation). The results further showed that only CNRS and CBO members had the authority to select particular beneficiaries for the limited AIG sources. Hence, a good number of beneficiaries and community members were deprived of the full benefits of the project. As a result, the local people appeared to depend only on experiential knowledge and their surrounding environment to procure knowledge and information on the benefits of the co-management approach. For this reason, local people had a view that the SFRS project concentrated only on forest conservation and management, while paying little attention on AIG activities. In contrast, the forest managers and the CBO members felt that the AIG activities of the SFRS project enabled the community members to diversify their livelihoods through engaging in various activities. Similar results were found in SNP (Chowdhury, 2013) and LNP (Haider and Kabir, 2014) under the IPAC project in Bangladesh, where community members were not satisfied with the project benefits. The local people of SNP reported weaknesses in the co-management committee (CMC, functioning as the CBO in the SFRS Project) and the CMC was accused of showing bias about whom to give AIG loans. The local people of SNP also suggested that the AIG loans should be allocated to a group of people, rather than to individuals (Chowdhury, 2013).

The second obvious difference between community members and CBO and CNRS members was regarding the opportunities for training on capacity building and advocacy programs that accelerated the livelihood diversification activities. Local community members believed that

the programs were arranged only for the CBO and direct beneficiaries, and therefore they were reluctant to participate in the program. Hence, flexible participation was missing in the SFRS Project. Similar findings were observed in SNP and LNP projects (USAID, 2013). Contrary results were also seen from the co-management approach in *Mokosh beel* in Bangladesh. This project, which was under both the MACH and IPAC, promoted aquatic resource management and poverty alleviation. It initiated training programs on capacity building for beneficiaries and led the fishers to shift from a sole dependency on fishing for their livelihoods to engaging in other trades and businesses (Winrock, 2007).

Regarding participation in the SFRS project, community members responded that they were represented in project activities such as AIG, training and monthly meetings, but their active participation at the grassroots level has not yet materialized. CNRS respondents and CBO members felt that local members achieved equal participation. Although project beneficiaries and local people had limited information about project activities, CBO members were an important part of decision-making processes in the planning and implementation of the project. Similar results were found in Zimbabwe in the development of Community Areas Management Program for Indigenous Resources (CAMPFIRE) (Chirenje et al., 2013). However, there are many examples of co-management approaches where communities had the power to take all project decisions. In southern Africa, communities in Malawi and Tanzania are engaged in industrial plantation programs (Wily, 2002) addressing critical issues like forest degradation and illegal selling of forest resources to Botswana (Mogaka et al, 2001). Namibia, Uganda, and Lesotho are also developing along the same path (Wily, 2002).

In the context of CBRM, there has often been a mismatch between the conservationists' views and perspectives of projects and the benefits (such as sharing of financial profit) and what

different stakeholders thought of the project and benefits (Songorwa 1999; Brown, 2002). Agarwal and Gibson (1999) think that in the community-based conservation approach, equity and empowerment are more important than economic incentives. They suggest that a conservation project should assist in decision-making processes that are "legitimate, accountable, and inclusive and that take into account multiple stakeholders and interests" (Agarwal and Gibson, 1999 cited in Berkes, 2004, P: 629).

6.7: Conclusion

Overall, the SFRS project has significantly affected the livelihood activities of local community members in the project area. Though the project initiated several AIG activities and capacity building training programs for the beneficiaries and other community members, all of them could not successfully access those activities for various reasons. Communication gaps among stakeholders, a vague benefit sharing mechanism to beneficiaries and accidental exclusion of some community members created a sense of disparity among the local community, CBO and CNRS representatives. Though a section of the local community were directly engaged with project activities, a large proportion of the community still remained outside of the project. As a result, different stakeholders held varied opinions regarding the project and its activities.

Chapter 7: Conclusion

7.1: Introduction

The purpose and objectives of my research were concerned with how forest managers (i.e. AF and CNRS) and the CBO constituted the structure and process of the SFRS project to ensure the active participation and deliberation of local forest resource users in order to achieve flooded forest conservation while securing communities' livelihoods. The major focus of SFRS was to promote restoration and conservation at Rahimapur flooded forest through a community-based approach. Through the project activities, SFRS has sought to address conservation issues in part by promoting communities' livelihood activities. However, such a community-based conservation approach centers on identifying how local communities' livelihood strategies and outcomes are affected by the activities of a development and/or conservation project under a sustainable livelihood approach. In this research, special attention has been given to the thoughts and opinions of local resource users, the CBO and forest managers with regard to the critical aspects of current management approaches, decision-making processes and future activities of the SFRS project, which the sustainable conservation and management of the flooded forest resources depends upon.

In particular, I investigated the mechanism of the SFRS project, the process of linking natural resource conservation and livelihood security, stakeholders' engagement processes through the project activities and the role of local resource users in accepting and participating in project activities, such as AIG and forest conservation. I have also examined how stakeholders were trained for capacity building and organizational development and how they applied their knowledge and experience in order to improve their livelihood. The overall goal of this research was to study the development efforts initiated by the SFRS project, which aimed to engage all the stakeholders and share tasks and responsibilities for sustainable conservation and management of

Rahimapur flooded forest, and to change the natural, human and social capital of local community members, particularly the poor and disadvantaged. This study also reflected upon the views and perspectives of all the relevant stakeholders, ranging from local community members to forest managers who shared the responsibilities of forest resource conservation with various interests. The conclusions are derived from the findings of the research, as are summarized in chapters four, five and six.

7.2: Major Findings of the Study

Key Finding 1: ***The SFRS project made a significant contribution in managing and conserving flooded forest resources, both in the forest area and homestead level.***

The research conducted in Rahimapur forest revealed how this degraded forest changed to a naturally regenerated forest throughout the phases of the SFRS project with the active participation of local people. Two types of organizations, namely the CBO and PIC, were created among the local community members by the SFRS project to carry out the plantation activities. During the first phase of the Project, 12.55 hectares of forest land was planted with 18,668 *Koroch* (*Pongamia pinnata*) saplings and 2,027 *Hijol* (*Barringtonia acutangula*) saplings. During the second phase of the project, a total number of 2,725 saplings were planted by extending 1.25 hectares of land under plantation. Throughout these phases, a number of other species were also planted in the forest, which included *Raintree* (*Samanea saman*), *Kodom* (*Neolamarckia cadamba*) and *Arjun* (*Terminalia arjuna*). A total of 600 saplings of these three species were planted at Rahimapur forest, which subsequently showed an 82% survival rate.

Not only was the forest area covered with flooded species, several new species were also introduced at the homestead level. Local community members were encouraged to conserve the naturally grown Cane (*Calamus sp.*) in the forest and further extend cane cultivation at the

homestead level. Economically and medicinally valuable plants like *Arjun* (*Terminalia arjuna*), *Basak* (*Justicia adhatoda*) and *Chikrashi* (*Chukrasia tabularis*) were introduced at the homestead level. A total of 9,215 saplings of different species such as *Murta* (*Schumannianthus dichotoma*), *Basak* (*Justicia adhatoda*), *Eucalyptus* (*Eucalyptus globulus*) and *Chikrashi* (*Chukrasia tabularis*) were distributed among the local communities, with an overall survival rate of 61.40%.

These initiatives helped the community members to realize the importance of the conservation and management of natural resources. Therefore, they actively participated in homestead plantation with economically and medicinally important species. Through this process, they reduced their dependency on forest resources, which eventually helped Rahimapur forest to become a denser and greener flooded forest.

Key Finding 2: ***A number of households have diversified their livelihood options by attending training programs and adopting the AIG activities presented by the SFRS project and had financial security and assets. These attributes revealed enhanced capacity building. However, some households were not able to utilize the AIG opportunities due to various reasons.***

A number of training programs were arranged for project beneficiaries on vegetable cultivation, seed preservation, seedling production and sapling and nursery management, which helped them to enhance their skills and knowledge. Such skill development activities assisted the beneficiaries to manage and diversify their livelihood activities. In my observation, a positive aspect of these training programs was that the community members were not induced to undertake new livelihood practices that would require new sets of skills, knowledge, and marketing mechanisms. Rather they continued with their prevailing and preferred livelihood strategies but could extend their knowledge and skills.

47.4% of the project beneficiaries received training on vegetable cultivation, of which most of the participants were female members. 6.03% of beneficiaries were trained on side veneer

grafting, splice grafting and bridge grafting techniques. Training programs were also arranged for the CBO and other beneficiaries on flooded forest management, sustainable conservation and systematic harvesting of forest resources, seedling production, sapling management and nursery establishment (Figure 5.2). However, 52.6% of beneficiaries did not receive training on vegetable gardening and expressed dissatisfaction for not getting the opportunity to earn additional income for their families from homestead gardening. It was also learned from the respondents that a few community members who were trained were unable to implement their knowledge and skill to improve their livelihood for various reasons such as monsoon flooding and lack of land ownership for homestead gardening.

Access to AIG opportunities helped a number of households to start new income generating activities and to increment their monthly incomes and build up assets. Excluding agriculture and fisheries, the poor community members had no permanent income generating sources to manage their livelihoods before they were involved with the SFRS project. Therefore, during the first two phases of the project, various types of vegetable seeds were distributed to project beneficiaries, including bottle gourd, radish, cowpeas, bean, sweet gourd and Indian spinach. Apart from vegetable seeds, beneficiaries were also provided with several fast growing species, like *Akashmoni* (*Acacia auriculiformis*) and *Ipil ipil* (*Leucaena leucocephala*) to meet the need of firewood.

Eight CBO members who had a patch of land were encouraged to plant *Murta* (*Schumannianthus dichotoma*) at their homestead, and only forty poor households were identified from the project beneficiaries to receive ICSs at a cheaper price. A very few beneficiaries were employed as patrol guards to protect the forest from poaching of valuable timber. Such activities

allowed the remaining beneficiaries, who did not directly benefit, to feel deprived and displeased towards the CBO and CNRS members.

Key Finding 3: The *Community-Based Organization was an essential component for implementation of the SFRS project. The community-based activities, sustenance, accountability, and achievements of the CBO members resulted in positive outcomes for the SFRS project and the overall conservation of the wetland natural resources of Rahimapur forest.*

The research findings have revealed that the CBO members were capable of contributing effectively to the participatory approach to forest management. The CBO members of the SFRS project were instrumental in organizing and mobilizing beneficiaries and the local community, framing rules and regulations for resource use, ensuring active participation of stakeholders in planning and implementation of project activities and sustainable resource management, and in facilitating consensus on complicated issues, like banning access for engine-driven boats during the monsoon season.

The overall evaluation of the CBO has shown that except for one, all the CBO members were successful in implementing their tasks; this was also affirmed by the CNRS members. Overall, the members of the *Rahimapur-Hariharpur Bon O Paribesh Vittik Krishi Somobay Somitee Limited* CBO established in the SFRS project were successful in restoring the flooded forests. They developed 12.55 hectares of plantation covered with 18,668 *Koroch* (*Pongamia pinnata*) and 2,027 *Hijol* (*Barringtonia acutangula*) trees, with an agreed upon benefit-sharing mechanism. Other major outcomes of the community-based forest management were to: generate funds for the sustainable management of Rahimapur forest, organize school activities on significant days (such as Forest Day, World Wetland day) to raise the awareness of students and teachers, demarcating forest area to avoid illegal access, and arranging monthly meetings. A resource harvesting code of conduct, outlining the rules and regulations of using and harvesting

forest resources, was developed by the CBO, under the guidance of CNRS members. For example, it was decided that local villagers would be allowed to collect forest leaves with prior permission from the CBO members. CBO members were also involved in regular patrolling of the forest, monitoring and arranging awareness campaigns to encourage local resource users to act against deforestation, bird hunting, and the use of engine driven boats inside the forest.

Key Finding 4: ***Regarding women's empowerment, the results were diverse and complex. Some women engaged themselves with the project activities (e.g., AIG activities) and diversified their livelihoods. However, some were still dependent on the male members of the family.***

Analysis of the three indicators of women's empowerment revealed that they were empowered in some dimensions and need improvement in others. For example, my study found that women who engaged in various AIG activities, such as homestead gardening, duck rearing or poultry farming, managed to generate additional income of their own and were relatively financially independent. 18.6% of women who were engaged with the CBO and PIC could go outside the village without being accompanied by male members of the family. While just a few years ago, rural Bangladeshi women had almost no scope for leaving their houses or had limited movement within the community (UNDP, 2008). Such a change in the study area was noticeable.

Data in Table 5.4 reveal that 56.9% of women had some level of assets in their own title. 10% had cash savings in NGOs, while 21.4% of women earned income for their families from poultry farming. It was reported that women's voices began to carry more weight since they had been involved in income generating activities. All women were able to make decisions about purchasing foodstuffs, stationeries and in matters of children's education. Some female members in the project area were selected to patrol the forest, which was an indicator of their empowerment (Figure 4.3). However, due to a lack of skills and knowledge of women compared to men, a good number of women needed their husband's help in income generating activities. For example, in

the homestead gardening project, the women produced vegetables and their husbands sold the products in the market. My findings therefore conclude that that although an enhancement of the level of women's empowerment in the project area could not be precisely measured, their social position has been advancing day by day.

Key Finding 5: Some of the community members had limited knowledge regarding the benefit sharing mechanism as well as other rules and regulations set by the SFRS project. Hence, spontaneous participation of all the community members was limited.

The rules and regulations of the SFRS project excluded all community members from using forest resources, with an exception for tree leaves and a semi-woody shrub named *Dhol kolmi*. Since a large section of poor communities was dependent on forest resources, the intervention of the SFRS project restricted their activities completely. Most of the community members had no or little knowledge about the rules of the project. Therefore, a large number of community members stated that they had a hard time maintaining their livelihoods under the current management system. As a result, 62% of community members felt that they had a low level of engagement with the SFRS project.

Moreover, the benefit sharing mechanism was not transparent to all the beneficiaries. Apart from the CBO members, most of the beneficiaries and other community members had little understanding about the benefits they will receive once the project ends. A number of respondents had no knowledge if their name was included on the beneficiary list. Therefore, the motivation for some local people to participate in forest management and conservation was nominal and limited.

7.3: Contributions of the Study

This study has made significant contributions towards the advancement of knowledge on community-based natural resource management in general, and flooded forest management in

Bangladesh in particular. To the best of my knowledge, this study is the first attempt to understand and assess the performance of interventions with a community-based management approach in the context of flooded forest conservation and management in Bangladesh. It sheds light on the engagement of local resource users with the project, which enabled the project to accomplish its activities under the community-based management approach. Specifically, insights were derived from the analysis of the collaborative approach by studying the conservation and development initiatives by the SFRS project, which highlight the importance of the effective participation of local community members in a collaborative process.

This research has shown how and why the participation of local resource users through a community-based management approach is critically important for effective resource management and public policy formulation. The participation of beneficiaries and local resource users in the process of capacity building and other project activities has been identified as a process of building the human and social capital of the project area, particularly for the CBO members and project beneficiaries. Such a collaborative approach, among CNRS, AF, the CBO and government officials, required developing relationships of trust and sharing of information and knowledge among all stakeholders, which are required to improve social networks. The participation and deliberations of the CBO with local community members were found to be critically important throughout the project period, as they provided the needed training, knowledge and exposure to the local participants. This study has revealed that local level organizations, like the CBO can establish cross-scale linkages, offer clarity through the flow of information and build trust among stakeholders. These elements are critically important for enhancing social capital.

The analysis of this research focused on the mobilization and capacity-building of local community members, local level institutional strengthening, organizational development and cross

scale institutional linkages for ensuring effective participation of stakeholders in forest resource management. The findings thus will provide the government with important policy direction to implement collaborative projects in the future. In particular, this study would be of great help for donor agencies, national and international NGOs and the Government of Bangladesh in selecting appropriate institutional and organizational mechanisms for stakeholders and adopting the most appropriate implementation approach in natural resource management initiatives.

7.4: Limitations of the Study

In Bangladesh, wetlands cover 16,000 sq. km. of area that include areas of the Sunamganj, Sylhet, Moulvibazar, Hobigonj, Netrokona, and Kishoreganj districts. In Sunamganj, there are about 133 *haors* that contain flooded forests. Some of the flooded forests in Sunamganj are Gobindapur forest, Manikkhila forest, Tahirpur forest, and Bishombhorpur forest. I conducted my study on a particular flooded forest, which might not be representative of the other flooded forests in Bangladesh in terms of attributes such as resource dependency, economic conditions of local communities and other socio-ecological characteristics. In wetland areas, the wet season generally starts in August and ends in October, and November and December are considered a transitional period from the wet to dry season. The dry season starts in January and continues up to April. Since I did my field research during the wet season, I was not able to observe how community members use their access to forest resources such as tree leaves and *Dhol kolmi*. Therefore, I could only rely on community members' responses and their experiential knowledge.

A particular problem I faced during data collection and analysis processes was the presence of local dialects of the community members of Jamalganj. My key informant helped me to comprehend some of the words I did not understand. The interviews were conducted with local dialects, recordings were transcribed and then translated into English for analysis. This research is

a cross-sectional study based only on participants' information. To analyze the actual growth of Rahimapur forest, a longitudinal study of the trees (e.g., measuring height, basal area) would be required.

Future studies should consider how the interventions helped build social capital through the association of male and female members as well as the participation of the seven villages in project activities. The views and perspectives of beneficiaries vs. non-beneficiaries of the SFRS project, in a comparative sense, should also be studied in the future. A longitudinal study is required to understand women's empowerment processes and outcomes in the project area. A more thorough analysis is required to account for vulnerable groups (such as the very poor, divorced, widows, female headed families and persons with disabilities) and to capture the complexity of their livelihood management under the co-management approach. Moreover, due to a lack of data regarding community members' education, number of children going to school, engagement with NGOs and women's assets before the intervention of SFRS project, it was not possible to compare the capital assets of the Rahimapur Forest area between the pre and post SFRS project periods. Hence, I was unable to measure the actual contribution of SFRS project. Future studies should capture these dimensions.

7.5: Concluding Remarks and Recommendations

The SFRS project has had many positive accomplishments, particularly regarding the large amount of forest land covered in its afforestation program, management of tree plantation at the homestead level, the large number of local people it trained and the tree nurseries it established. It has made great contributions in building the human and social capital of local communities, particularly regarding women's empowerment. Apart from these development initiatives of the SFRS project, the existing formal management system has shown limited success in stakeholder participation, in

managing access to forest resources by poor community members and in improving their livelihoods. Though almost all the forest resources were being entitled to limited local resource users, access to these resources had been influenced by illegal loggers. In addition, local people's experience with CBO members was not always satisfactory. Even if the CBO members and local community members performed the project responsibilities together in a satisfactory manner, there was a sense of dissatisfaction among some local members. For example, a considerable number of villagers believed that CBO and CNRS members were trying to focus only on forest conservation, giving minimum concentration on AIG activities and the livelihood security of local community members. Communities' experience with the benefit sharing mechanism was also reported to be confusing. Most of the beneficiaries, and some CBO members as well, seemed unsure about how the benefit sharing mechanism would take place. Since benefits were a vital element for encouraging people to negotiate, come to an agreement and participate in project activities, it would have been more effective if such decisions were made transparent to the beneficiaries and they were actively engaged with project activities. Despite the enormous potential of the SFRS project, it struggled in some places as the local communities' participation was limited.

The reasons for some of the CBO members' disappointing performance were complex and varied. Some senior CBO members were clearly unconvinced about the importance of community participation. Their perspective of participatory or collaborative forest management appeared to be that community members were compelled to do what CBO and CNRS members wanted them to do.

Considering the views and perspectives of local communities, CBO members, AF and CNRS members, and considering the key findings of my study, I have identified several critical issues that needed to be addressed. These are to: improve the relations between the CBO members

and local community, ensure the socio-economic development of local people and remove obstacles from the impactful journey of the SFRS project. Based on this, I make the following recommendations:

- Incentives are major elements to encourage people to participate, negotiate and to reach to an agreement for a co-management arrangement. Community mobilization towards forest conservation and AIG would be enhanced when the community "sees the benefits". All the beneficiaries should have a clear idea about the benefits stakeholders will receive in such a co-management arrangement.
- Not all the beneficiaries were trained in capacity building activities due to the financial constraints of the project. A substantial budget allocation should be arranged to implement capacity building and awareness programs for all the beneficiaries as well as other community members in the local area.
- As sharing of information and knowledge through group meetings is an important factor identified by the local people, CBO members should continue organizing group meetings and other activities with local people to keep them involved and updated about the project's activities and performance.
- Though the Rahimapur forest area has immense potential for ecotourism development, there is no organized ecotourism infrastructure in the locality. Training of local young people as eco-tour guides and supporting the community with ecotourism prospects would be an important initiative for the project. Similarly, selling local handicrafts such as *Shital pati* could be a source of income for local communities.

A number of issues need further research for a more comprehensive understanding of the effect of a co-management approach on different types of flooded forests in Bangladesh. As stated

earlier, there are variations among the attributes of flooded forests in Bangladesh in terms of community dependency, uses and ecosystem health components. To find a complete picture of the of the co-management approach and its impact on forest conservation and the livelihoods of local communities and their dependence on forest resources, examining samples from each flooded forest would be necessary. In addition to the livelihoods of local communities, studies on the health of the flooded forests in Bangladesh are also required.

The SFRS project commenced only in 2009. The project will terminate in 2019, when the mature parts of the forest will be harvested and the benefits will be shared among the stakeholders. The long term consequences, potential and sustainability of this project are therefore yet to be assessed. This study is a step towards understanding how the project has mobilized stakeholders through its activities and ensured linking forest conservation with livelihood security. It is also a first step towards identifying the obstacles to the active participation of stakeholders and exploring local community's experiences in changing their natural, human and social capital through project activities. Though I discussed many issues and concerns regarding the conservation and restoration efforts of the project by linking them with livelihood security and the socio-ecological development of the project area, other issues were outside the scope of my research.

References

Afrin, S., Islam, N., & Ahmed, S. U. (2010). Micro credit and rural women entrepreneurship Development in Bangladesh: A multivariate Model.

Agarwal, A., & Gibson, C. C. (1999). Enchantment and disenchantment: the role of community in natural resource conservation. *World development*, *27*(4), 629-649.

Agrawal, A., & Ostrom, E. (2001). Collective action, property rights, and decentralization in resource use in India and Nepal. *Politics & Society*, *29*(4), 485-514.

Agrawal, A. (2001). Common property institutions and sustainable governance of resources. *World Development*, *29*(10), 1649-1672.

Ahmed, I., Deaton, B. J., Sarker, R., & Virani, T. (2008). Wetland ownership and management in a common property resource setting: A case study of *Hakaluki Haor* in Bangladesh. *Ecological Economics, 68,* 429-436.

Ali, R. (2012). Changing Expectations of Gender Roles in Bangladesh: The Case of Female Field Staff of BRAC. *Research Monograph Series*, (52).

Alam, A., & Ihsan, S. (2012). Role of Participatory Rural Appraisal in Community Development (A Case Study of Barani Area Development Project in Agriculture, Live Stock and Forestry Development in Kohat). *International Journal of Academic Research in Business and Social Sciences*, *2*(8), 25.

Anderson, J., & Mehta, S. (2013). A global assessment of community based natural resource management: addressing the critical challenges of the rural sector. *USAID, Washington, DC, USA.*

Armitage, D. R., Plummer, R., Berkes, F., Arthur, R. I., Charles, A. T., Davidson-Hunt, I. J., ... & McConney, P. (2009). Adaptive co-management for social–ecological complexity. *Frontiers in Ecology and the Environment*, *7*(2), 95-102.

Arannayk Foundation. (2018). Current Projects. Available from http://www.arannayk.org/index.php?option=com_content&view=article&id=3&Itemid=109

Arntzen, J. W. (2003). *An economic view on wildlife management areas in Botswana* (No. 10). IUCN/SNV CBNRM Support Programme.

Arntzen, J., Buzwani, B., Setlhogile, T., Kgathi, D. L., & Motsolapheko, M. K. (2007). Community-based resource management, rural livelihoods and environmental sustainability. *Centre for Applied Research, Gaborone, Botswana*.

Asaduzzaman, M., Kabir, R. N., & Radović-Marković, M. (2015). Gender Inequality in Bangladesh. *Journal of Women's Entrepreneurship and Education*, (3-4), 54-64.

Ashley, C., & Roe, D. (1998). *Enhancing community involvement in wildlife tourism: issues and challenges* (Vol. 11). IIED.

Babulo, B., Muys, B., Nega, F., Tollens, E., Nyssen, J., Deckers, J., & Mathijs, E. (2008). Household livelihood strategies and forest dependence in the highlands of Tigray, Northern Ethiopia. *Agricultural Systems*, *98*(2), 147-155.

Ballet, J., Koffi, K. J. M., & Komena, K. B. (2009). Co-management of natural resources in developing countries: The importance of context. *Économie internationale*, (4), 53-76.

Bangladesh Bureau of Statics (BBS). (2007). *Statistical Year Book of Bangladesh*, Ministry of Planning, Government of the Peoples Republic of Bangladesh, Dhaka.

Barley, S. R., & Kunda, G. (2006). Contracting: A new form of professional practice. *The Academy of Management Perspectives*, *20*(1), 45-66.

Baron, S.B., Kerr, N. and Miller, N. (2003). *Group process, group decision and group action*. Milton Keynes: Open University Press.

Baumann, P. (2002). Improving access to natural resources for the rural poor. A critical analysis of central concepts and emerging trends from a sustainable livelihoods perspective. *LSP Working Paper (FAO)*.

Begum, H. A. (2005). Empowerment of women in Bangladesh: TMSS Experience. In *Conference on "Beijing* (Vol. 10).

Belal, M. A. H. (2013). Effectiveness of Co-management committees in Teknaf Wildlife Sanctuary. In Jafferson Fox, M.G. Mustafa, Bryan, R. B., Stephen, M. B., Laurie, D., Connecting communities and conservation: Co-management initiatives implemented by IPAC in Wetlands and Forests of Bangladesh.

Berger-Bartlett, H., & Craig, T. (2002). The Challenges of Stakeholder Participation: examples of evaluation projects from the Youth Justice context. In *Online]*. *Paper presented at the 2002 Australasian Evaluation Society International Conference October/November*.

Berkes, F. (1994). Co-management: bridging the two solitudes. *Northern perspectives*, *22*(2-3), 18-20.

Berkes, F. (2004). Rethinking community-based conservation. *Conservation biology*, *18*(3), 621-630.

Berkes, F. (2007). Community-based conservation in a globalized world. *PNAS.* 104 (39): 15188- 15193.

Berkes, F., Colding, J., & Folke, C. (Eds.). (2008). *Navigating social-ecological systems: building resilience for complexity and change*. Cambridge University Press.

Berkes, F. (2009). Evolution of co-management: role of knowledge generation, bridging organizations and social learning. *Journal of environmental management*, *90*(5), 1692-1702.

Berkes, F. (2012). Sacred Ecology, 3rd ed. Routledge, New York and London.

Bernard, R. H. (2006). *Research methods in anthropology: Qualitative and quantitative approaches*, (4th ed.). Lanham, MD: Altamira Press.

Bevanger, K., Datta, A. K., Eid, A. T., & Shirin, M. (2001). Tanguar Haor Wetland Biodiversity Conservation Project- an Appraisal. *NINA Project Report*, (16), 37.

Blaikie, P. (2006). Is small really beautiful? Community-based natural resource management in Malawi and Botswana. *World Development*, *34*(11), 1942-1957.

Bonomo, L., & Kirchstein, K. (2010). Microfinance Plus – Why does it matter and how can it be approached? About the UMM workshop and this publication. 4th University Meets Microfinance Workshop, University of Bergamo, Italy, 22 October 2010.

Bowie, N. (1988). The moral obligations of multinational corporations. *Problems of international justice*, *97*, 113.

Bowler, D., Buyung-Ali, L., Healey, J. R., Jones, J. P., Knight, T., & Pullin, A. S. (2010). The evidence base for community forest management as a mechanism for supplying global environmental benefits and improving local welfare. *CEE review*, 08-011.

Brosius, J. P., Tsing, A. L., & Zerner, C. (1998). Representing communities: Histories and politics of community-based natural resource management.

Brooks, T. M., Mittermeier, R. A., da Fonseca, G. A., Gerlach, J., Hoffmann, M., Lamoreux, J. F., & Rodrigues, A. S. (2006). Global biodiversity conservation priorities. *Science*, *313*(5783), 58-61.

Brown, K. (2002). Innovations for conservation and development. *The geographical journal*, *168*(1), 6-17.

Bryson, J. M., Cunningham, G. L., & Lokkesmoe, K. J. (2002). What to do when stakeholders matter: The case of problem formulation for the African American Men Project of Hennepin County, Minnesota. *Public Administration Review*, *62*(5), 568-584.

Cahn, M. (2002). *The business of living: rural micro-enterprise and sustainable livelihoods* (Unpublished doctoral thesis in progress). Massey University, Palmerston North, New Zealand.

Carney, D. (Ed.). (1998). *Sustainable rural livelihoods: What contribution can we make?* (p. 213). London: Department for International Development.

Chakraborty, T. R. (2006). Management of haors, baors, and beels in Bangladesh: Lessons for lake basin management. *IUCN Bangladesh Country Office, Dhaka, Bangladesh*, 1-15.

Chambers, R., & Conway, G. (1992). *Sustainable rural livelihoods: practical concepts for the 21st century*. Institute of Development Studies (UK).

Chambers, R. (1994). Participatory rural appraisal (PRA): Challenges, potentials and paradigm. *World Development*, *22*(10), 1437-1454.

Chambers, R., and Blackburn, J. (1996). The Power of Participation: PRA and Policy. Sussex: Institute of Development Studies. Accessed from opendocs.ids.ac.uk/opendocs/handle/123456789/280.

Chambers, R., (2004). Ideas for Development: Reflecting Forwards. Sussex: Institute of Development Studies. Accessed on 5th December, 2017 from http://www.ids.ac.uk/ids/.

Chambers, R. (2006). Vulnerability, coping and policy (editorial introduction). *IDS bulletin*, *37*(4), 33-40.

Chambers, R. (1983) *Rural Development: putting the last first*. London: Longman.

Chambers, R. (1994). Participatory Rural Appraisal (PRA): Analysis and Experience. *World Development*, *22*(9), 1253-1268.

Chan, S. (2004). *Important bird areas in Asia: key sites for conservation*. BirdLife International.

Child, B. (2005). Principles, practice and results of CBNRM in southern Africa. In B. Child & L. M. West (Eds.), *Natural resources as community assets* . Washington, DC: Sand County Foundation and the Aspen Institute.

Chirenje, L. I., Giliba, R. A., & Musamba, E. B. (2013). Local communities' participation in decision-making processes through planning and budgeting in African countries. *Chinese Journal of Population Resources and Environment*, *11*(1), 10-16.

Chowdhury, R. I. (2013). Attitudes towards co-management: Is Satchari National Park a suitable model for Bhawal National Park?. In Jafferson Fox, M.G. Mustafa, Bryan, R. B., Stephen, M. B., Laurie, D., Connecting communities and conservation: Co-management initiatives implemented by IPAC in Wetlands and Forests of Bangladesh.

Clarke, T., & Clegg, S. (1998). *Changing paradigms: The transformation of management knowledge for the 21st century*. HarperCollins Business.

Clarkson, M. E. (1995). A stakeholder framework for analyzing and evaluating corporate social performance. *Academy of management review*, *20*(1), 92-117.

CNRS (Center for Natural Resource Studies). (2009). Inception Report (Unpublished manuscript). Submitted to Arannayk Foundation, Dhaka.

CNRS (Center for Natural Resource Studies). (2011). SFRS Second Year Progress Report (Unpublished manuscript). Submitted to Arannayk Foundation, Dhaka.

CNRS (Center for Natural Resource Studies). (2012). Proposal on Swamp Forest Restoration in Sunamganj district Project Extension Phase (Unpublished). Submitted to Arannayk Foundation, Dhaka.

CNRS (Center for Natural Resource Studies). (2013). Proposal on Swamp Forest Restoration in Sunamganj district Project Extension Phase (Unpublished). Submitted to Arannayk Foundation, Dhaka.

CNRS (Center for Natural Resource Studies). (2014). Proposal on Swamp Forest Restoration in Sunamganj district Project Extension Phase (Unpublished). Submitted to Arannayk Foundation, Dhaka.

CNRS (Center for Natural Resource Studies). (2015). Proposal on Swamp Forest Restoration in Sunamganj district Project Extension Phase (Unpublished). Submitted to Arannayk Foundation, Dhaka.

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches*. Los Angeles, United States of America: Sage Publication.

Creswell, J. W. (2009). Research Design Qualitative, Quantitative, and Mixed Method Approaches. Thousand Oaks, CA: Sage Publication.

Crowe, S., Cresswell, K., Robertson, A., Huby, G., Avery, A., & Sheikh, A. (2011). The case study approach. *BMC medical research methodology*, *11*(1), 100.

Dale, A., & Armitage, D. (2011). Marine mammal co-management in Canada's Arctic: Knowledge co-production for learning and adaptive capacity. *Marine Policy*, *35*(4), 440-449.

Dasgupta, S., Laplante, B., Wang, H., & Wheeler, D. (2002). Confronting the environmental Kuznets curve. *Journal of economic perspectives*, *16*(1), 147-168.

Davidson-Hunt, I.J., O'Flaherty, R.M., 2007. Researchers, indigenous peoples and place-based learning communities. *Society and Natural Resources* 20, 291–305.

Denzin, N. K. & Lincoln, Y.S.(Eds). (2005). *The sage handbook of qualitative research* (3rd ed.) Thousand Oaks, CA: Sage Publications.

DFID, U. K. (1999). Sustainable livelihoods guidance sheets. *London: DFID*.

Dunn, K. (2005). Interviewing",[in:] Hay, I.(ed.), Qualitative Research Methods in Human Geography, Oxford: Oxford University Press.

Edelenbos, J., Van Buuren, A., & van Schie, N. (2011). Co-producing knowledge: joint knowledge production between experts, bureaucrats and stakeholders in Dutch water management projects. *Environmental Science & Policy*, *14*(6), 675-684.

Efroymson, D., Biswas, B., & Ruma, S. (2007). The Economic Contribution of Women in Bangladesh through their Unpaid Labour. *Financial and Technical Support, HealthBridge, Canadian International Development Agency (CIDA), VVTBB Trust-HealthBridge, Dhaka*.

Ekins, P. (2003). Identifying critical natural capital: Conclusions about critical natural capital. *Ecological economics*, *44*(2), 277-292.

Elasha, B. O., Elhassan, N. G., Ahmed, H., & Zakieldin, S. (2005). Sustainable livelihood approach for assessing community resilience to climate change: case studies from Sudan. *Assessments of Impacts and Adaptations to Climate Change (AIACC) Working Paper*, *17*.

Ellis, F. (2000). *Rural livelihoods and diversity in developing countries*. Oxford university press.

Ellis, F., and Freeman, A. (2004). Poverty Reduction in Four African Countries. *The Journal of Development Studies*, *40*(4), 1-30.

Eshuis, J., & Stuiver, M. (2005). Learning in context through conflict and alignment: Farmers and scientists in search of sustainable agriculture. *Agriculture and human values*, *22*(2), 137- 148.

Fang, Y. P. (2013). The effects of natural capital protection on pastoralist's livelihood and management implication in the source region of the Yellow River, China. *Journal of Mountain Science*, *10*(5), 885-897.

Ferdousi, U. K. (2013). Sustainable rural livelihoods and co-management intervention: the case of Mokosh beel, Gazipur, Bangladesh. In Jafferson Fox, M.G. Mustafa, Bryan, R. B., Stephen, M. B., Laurie, D., Connecting communities and conservation: Co-management initiatives implemented by IPAC in Wetlands and Forests of Bangladesh.

Food and Agriculture Organization. (FAO). (2007). National Forest and Tree Resources Assessment 2005-2007. Bangladesh.

Forest Department. (2017). Ministry of Environment and Forests. Government of the People's Republic of Bangladesh Forest Investment Programme.

Fox, J., Mustafa, M. G., Bushley, B. R., Brennan, S. M., & Durand, L. (2013). Connecting communities and conservation: co-management initiatives implemented by IPAC in wetlands and forests of Bangladesh.

Gerritsen, P., & Wiersum, F. (2005). Farmer and conventional perspectives on conservation in Western Mexico. *Mountain Research and Development*, *25*(1), 30-36.

German, L., Mazengia, W., Tirwomwe, W., Ayele, S., Tanui, J., Nyangas, S., Begashaw, L., Taye, H., Admassu, Z., Tsegaye, M., Alinyo, F., Mekonnen, A., Aberra, K., Chemangeni, A.,Cheptegei, W., Tolera, T., Jotte, Z., Bedane, K., (2008). Enabling Equitable Collective Action and Policy Change for Poverty Reduction and Improved Natural Resource Management in the Eastern African Highlands. CAPRi Working Paper No. 86. *International Food Policy Research Institute*,Washington, DC.

Ghimire, K. B., & Pimbert, M. P. (1997). Social change and conservation: an overview of issues and concepts. *Social change and conservation: Environmental politics and impacts of national parks and protected areas*, 1-45.

Gilchrist, V.J. and Robert J Williams (1999). Key Informant Interviews. In B.F. Crabtree & W.L. Miller (Eds.), *Doing Qualitative Research*, 2nd Edition (pp 71-88). Thousand Oaks: Sage Publications Inc.

Goetz, A. M., & Gupta, R. S. (1996). Who takes the credit? Gender, power, and control over loan use in rural credit programs in Bangladesh. *World Development*, *24*(1), 45-63.

Government of Bangladesh 1979. *Bangladesh National Forest Policy 1979.* Ministry of Agriculture, Government of the Peoples' Republic of Bangladesh, Dhaka, p. 15.

Grameen Bank. (2009). The Noble Peace Prize 2006. Accessed from http://www.grameen-info.org.

Grimble, R., & Chan, M. K. (1995). Stakeholder analysis for natural resource management in developing countries. In *Natural resources forum*(Vol. 19, No. 2, pp. 113-124). Blackwell Publishing Ltd.

Guiso, L., Sapienza, P., & Zingales, L. (2004). The role of social capital in financial development. *American economic review*, *94*(3), 526-556.

Hahn, T., Olsson, P., Folke, C., & Johansson, K. (2006). Trust-building, knowledge generation and organizational innovations: the role of a bridging organization for adaptive comanagement of a wetland landscape around Kristianstad, Sweden. *Human ecology*, *34*(4), 573-592.

Haider, F., & Kabir, M. H. (2014). Preliminary impacts of a co-management program at Lawachara National Park. *Bangladesh. Journal of Biodiversity Management & Forestry*, *3*, 1-6.

Hashemi, S. M., Schuler, S. R., & Riley, A. P. (1996). Rural credit programs and women's empowerment in Bangladesh. *World Development*, *24*(4), 635-653.

Hassan, A. E. (2015). NGOs and Their Implications in Promoting Social Development in Bangladesh: An Overview. *Sociology and Anthropology*, *3*(1), 24-36.

Heron, J., & Reason, P. (1997). A participatory inquiry paradigm. *Qualitative inquiry*, *3*(3), 274-294.

Hoque, M. R., Khan, M. S. I., & Ahmed, R. (2005). *Approaches to sustainable wetland resource management*. IUCN--The World Conservation Union, Bangladesh Country Office.

Hoque, M. E. (2008). Evaluating co-management as a tool for the reduction of poverty and inequality in Chunati Wildlife Sanctuary. *Connecting communities and conservation: collaborative management of protected areas in Bangladesh. Honolulu: East-West Center*, 227-246.

Houston, J. E., & Huguley, H. (2014). The Role of Nutrition and Women's Empowerment in Human Capital Development. *Journal of Food Distribution Research*, *45*(1).

Hubacek, K., & Mauerhofer, V. (2008). Future generations: economic, legal and institutional aspects. *Futures*, *40*(5), 413-423.

Hussain, M. G. (2010). Fresh water fish of Bangladesh: fisheries, biodiversity, and habitat, *Aquatic Ecosystem Health & Management*, 13(1), 85-93.

Innes, J. E., & Booher, D. E. (2004). Reframing public participation: strategies for the 21st century. *Planning theory & practice*, *5*(4), 419-436.

Irwin, A., Simmons, P., & Walker, G. (1999). Faulty environments and risk reasoning: the local understanding of industrial hazards. *Environment and planning A*, *31*(7), 1311-1326.

Islam, S. N., & Gnauck, A. (2007). Effects of salinity intrusion in mangrove wetlands ecosystems in the Sundarbans: an alternative approach for sustainable management. *Wetlands: Monitoring Modelling and Management. Leiden: Taylor & Francis*, 315-322.

Islam, S. N., & Gnauck, A. (2009). Threats to the Sundarbans mangrove wetland ecosystems from transboundary water allocation in the Ganges basin: A preliminary problem analysis. *International Journal of Ecological Economics & Statistics*, *13*(W09), 64-78.

Islam, S. N. (2010). Threatened wetland and ecologically sensitive ecosystems management in Bangladesh. *Front. Earth Sci. China, 4* (4), 434-448.

Islam, K. K., Kimihiko, H., Takahiro, F., & Sato, N. (2011). Confronting people-oriented forest Management realities in Bangladesh: An Analysis of actors' perspective. *Int. J. Soc. For*, *4*, 153-179.

Johnson, N., Lilja, N., Ashby, J. A., & Garcia, J. A. (2004). The practice of participatory research and gender analysis in natural resource management. In *Natural Resources Forum* (Vol. 28, No. 3, pp. 189-200). Blackwell Publishing Ltd.

Kabumbuli, R., & Kiwazi, F. W. (2009). Participatory planning, management and alternative livelihoods for poor wetland-dependent communities in Kampala, Uganda. *African journal of ecology*, *47*(s1), 154-160.

Kanowski, J., Catterall, C., Freebody, K., Freeman, A., & Harrison, D. (2010). Monitoring Revegetation Projects in Rainforest Landscapes. Toolkit Version 3. *Reef and Rainforest Research Centre: Cairns, Qld*.

Karim, Q. M. N. (2008). Can alternative income generating activities reduce dependence on protected areas? Evidence from Teknaf Game Reserve. *Connecting communities and conservation: Collaborative management of protected areas in Bangladesh. USA: United States Agency for International Development (USAID)*, 213-230.

Kawulich, B. B. (2005, May). Participant observation as a data collection method. In *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research* (Vol. 6, No. 2).

Kellert, S. R., Mehta, J. N., Ebbin, S. A., & Lichtenfeld, L. L. (2000). Community natural resource management: promise, rhetoric, and reality. *Society & Natural Resources*, *13*(8), 705-715.

Khan, S. M., Haq, E., Huq, S., Rahman, A. A., Rashid, S. M. A., Ahmed, H. (1994). Wetlands of Bangladesh. Dhaka: *Holiday Printers Limited*, 1–88.

Khan, M. H. (2004). *Haors, baors*, and *beels*: Sources of livelihood in Bangladesh. *World Conservation* 2(2004):20-21.

Khan, M.T. (2008). The Nishorgo Support Project, the Lawachara National Park, and the Chevron seismic survey: forest conservation or energy procurement in Bangladesh? *Journal of Political Ecology 17*: 68-78.

Khan, S. M. M. H. (2012). Participatory Wetland Resource Governance in Bangladesh: An Analysis of Community-based experiments in Hakaluki *haor*. Natural Resources Institute, University of Manitoba, Winnipeg, MB, Canada.

Kolahi, M., Sakai, T., Moriya, K., Makhdoum, M. F., & Koyama, L. (2013). Assessment of the effectiveness of protected areas management in Iran: Case study in Khojir National Park. *Environmental management*, *52*(2), 514-530.

Krantz, L. (2001). The sustainable livelihood approach to poverty reduction. *SIDA. Division for Policy and Socio-Economic Analysis*.

Kuhnert, P. M., Martin, T. G., & Griffiths, S. P. (2010). A guide to eliciting and using expert knowledge in Bayesian ecological models. *Ecology letters*, *13*(7), 900-914.

Laidler, G. J., Ford, J. D., Gough, W. A., et al. (2009). Travelling and hunting in a changing Arctic: assessing Inuit vulnerability to sea ice change in Igloolok, Nunavut. Climatic Change 94: 363–397.

Landell-Mills, N., & Porras, I. T. (2002). Silver bullet or fools' gold?: a global review of markets for forest environmental services and their impact on the poor.

Liamputtong, P. (2009). *Qualitative research methods*.

Leedy, P. D., & Ormrod, J. E. (2005). *Practical research*. Pearson Custom.

Loorbach, D. and Rotmans, J. (2006) Managing Transitions for Sustainable Development; In: *Understanding Industrial Transformation: views from different disciplines*. X. Olshoorn and A. J. Wieczorek (eds), Dordrecht, Springer.

Mace, G. M., Masundire, H., J. E. M. Baillie. (2005) Ecosystems and Human Well-Being: Current State and Trends: Findings of the Condition and Trends Working Group. Chapter 4. (Millennium Ecosystem Assessment Series, Island Press, Washington, DC, vol. 1, 2005),

MacAlister, C., & Mahaxay, M. (2009). Mapping wetlands in the Lower Mekong Basin for wetland resource and conservation management using Landsat ETM images and field survey data. *Journal of Environmental Management*, *90*(7), 2130-2137.

Malhotra, Y. (2000). *Current business concerns and knowledge management. Excerpts interview by the Times of India*. Retrieved on 10 December 2017 from http://www.brint.com/interview/times.htm

Mapedza, E., & Bond, I. (2006). Political deadlock and devolved wildlife management in Zimbabwe: The case of Nenyunga Ward. *The Journal of Environment & Development*, *15*(4), 407-427.

Marschke, M., & Sinclair, A. J. (2009). Learning for sustainability: Participatory resource management in Cambodian fishing villages. *Journal of environmental management*, *90*(1), 206-216.

Mayoux, L. (1998). Participatory Learning for Women's Empowerment in Micro-Finance Programmes: Negotiating Complexity, Conflict and Change. *IDS bulletin*, *29*(4), 39-50.

Mbaiwa, J. E. (2015). Community-based natural resource management in Botswana. In *Institutional arrangements for conservation, development and tourism in Eastern and Southern Africa* (pp. 59-80). Springer, Dordrecht.

Merchant, C. (1995). Earth care: Women and the environment. Routledge: New York.

Mitchell, R. K., Agle, B. R., & Wood, D. J. (1997). Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. *Academy of management review*, *22*(4), 853-886.

Minkler, M. (2005). Community-based research partnerships: challenges and opportunities. *Journal of Urban Health*, *82*(2), ii3-ii12.

Mogaka, H. (2001). *Economic aspects of community involvement in sustainable forest management in Eastern and Southern Africa* (No. 8). IUCN.

Mosse, D. (2001). 'People's knowledge', participation and patronage: Operations and representations in rural development.

Muhammed, N., Koike, M., Sajjaduzzaman, M. D., & Sophanarith, K. (2005). Reckoning social forestry in Bangladesh: policy and plan versus implementation. *Forestry*, *78*(4), 373-383.

Mukul, S. A., Herbohn, J., Rashid, A. Z. M. M., & Uddin, M. B. (2014). Comparing the effectiveness of forest law enforcement and economic incentives to prevent illegal logging in Bangladesh. *International Forestry Review*, *16*(3), 363-375.

Nawaz, F. (2009). Strategy for Improving Human Capital in Bangladesh and Nepal: Does it Help for Women Empowerment?

Newell, P. (2000). "Access to Environmental Justice: Regulation TNCs Through Litigation, Limits and Possibilities." Draft Paper, Institute of Development Studies, Brighton, U.K., mimeo.

Nelson, F., & Agrawal, A. (2008). Patronage or participation? Community-based natural resource management reform in sub-Saharan Africa. *Development and change*, *39*(4), 557-585.

Nishat, A. (1993). Freshwater wetlands in Bangladesh: Status and issues. In: Nishat A, Hossain B, Roy M K, Karim A, eds. Freshwater Wetlands in Bangladesh Issues and Approaches for Management. Dhaka: IUCN, 9–22.

On-prom, S. (2014). Community-Based Mangrove Forest Management in Thailand: Key Lesson Learned for Environmental Risk Management. In *Sustainable Living with Environmental Risks* (pp. 87-96). Springer, Tokyo.

Ostrom, E. (1990). *Governing the commons: the evolution of institutions for collective action*. Cambridge: Cambridge University Press.

Otieno G.O. (2007). *Measuring effectiveness of constituency development fund on poverty reduction in Siaya district*. Economics and Social Sciences Department, Maseno University.

Papineau, D., & Kiely, M. C. (1996). Participatory evaluation in a community organization: Fostering stakeholder empowerment and utilization. *Evaluation and program planning*, *19*(1), 79-93.

Patwary, M. K. H. (2008). Assessing stakeholder participation in co-management activities at Chunati Wildlife Sanctuary. *Connecting communities and conservation: collaborative management of protected areas in Bangladesh. Bangladesh Forest Department, Dhaka*, 157-189.

Pearce, D. (Ed.). (1986). *The MIT dictionary of modern economics* (3rd ed.). Cambridge, MA: The MIT Press.

Peloquin, C., and Berkes, F. (2009). Local knowledge, subsistence harvests, and social–ecological complexity in James Bay. Human Ecology 37: 533–545.

Pennar, K., & Mueller, T. (1997). The ties that lead to prosperity. *Business Week*, *15*(1), 153-154.

Persha, L., Agrawal, A., & Chhatre, A. (2011). Social and ecological synergy: local rulemaking, forest livelihoods, and biodiversity conservation. *science*, *331*(6024), 1606-1608.

Petts, J., & Brooks, C. (2006). Expert conceptualisations of the role of lay knowledge in environmental decision making: challenges for deliberative democracy. *Environment and planning A*, *38*(6), 1045-1059.

Pimm, S. L., Russell, G. J., Gittleman, J. L., & Brooks, T. M. (1995). The future of biodiversity. *Science*, *269*(5222), 347-350.

Pitt, M. M., Khandker, S. R., McKernan, S., & Latif, M. A. (1995). Credit programs for the poor and reproductive behavior in low income countries: Are the reported causal relationships the result of heterogeneity bias?. In *annual meeting of the Population Association of America, San Francisco*.

Pomeroy, R. S. (1998). A process for community-based fisheries co-management. *Naga, The ICLARM Quarterly*, *21*(1), 71-75.

Powell, R. A. and Single, H. M. 1996. Focus Groups. Methodology matters-V. International *Journal for quality in health care*. 8(5): 499-504.

Pretty, J. N., & Vodouhe, S. D. (1997). Using rapid or participatory rural appraisal. *Improving Agricultural Extension*, 47-55.

Pretty, J. (1998). *The living land: Agriculture food and community regeneration in rural Europe*. London, UK: Earthscan Publications.

Pretty, J., & Ward, H. (2001). Social capital and the environment. World development, 29(2), 209- 227.

Pretty, J., & Smith, D. (2004). Social capital in biodiversity conservation and management. Conservation biology, 18(3), 631-638.

Putnam, R. D. (2001). *Bowling alone: The collapse and revival of American community*. Simon and Schuster.

Rahman, M. M. & Islam, M. A. (2007). Cluster based management approaches for wetlands: CNRS's Experience in CBFM-2 project.

Rahman, M. H., & Miah, M. D. (2017). Are Protected Forests of Bangladesh Prepared for the Implementation of REDD+? A Forest Governance Analysis from Rema-Kalenga Wildlife Sanctuary. *Environments*, *4*(2), 43.

Ramirez, R. (1999). Stakeholder analysis and conflict management. *Cultivating peace: conflict and collaboration in natural resource management*, 101-126.

Rashid, A. M., Craig, D., Mukul, S. A., & Khan, N. A. (2013). A journey towards shared governance: status and prospects for collaborative management in the protected areas of Bangladesh. *Journal of forestry research*, *24*(3), 599-605.

Reed, M. S., Graves, A., Dandy, N., Posthumus, H., Hubacek, K., Morris, J., ... & Stringer, L. C. (2009). Who's in and why? A typology of stakeholder analysis methods for natural resource management. *Journal of environmental management*, *90*(5), 1933-1949.

Reid, H., Cannon, T., Berger, R., Alam, M., & Milligan, A. (2009). Community-based adaptation to climate change. Participatory Learning and Action 60. *International Institute for Environment and Development, London, UK*.

Ribot, J. C., & Peluso, N. L. (2003). A theory of access. *Rural sociology*, *68*(2), 153-181.

Rodrigues, R.R.; Lima, R.A.F.; Gandolfi, S.; Nave, A.G. On the restoration of high diversity forests: 30 years of experience in the Brazilian Atlantic Forest. Biol. Conserv. 2009, 142, 1242–1251.

Roodman, D., & Morduch, J. (2014). The impact of microcredit on the poor in Bangladesh: Revisiting the evidence. *Journal of Development Studies*, *50*(4), 583-604.

Rudd, M. A. (2004). An institutional framework for designing and monitoring ecosystem-based fisheries management policy experiments. *Ecological Economics*, *48*(1), 109-124.

Sachs, J. D. (2005). *Investing in development: a practical plan to achieve the millennium development goals*. Earthscan.

Sachs, J. D., Baillie, J. E., Sutherland, W. J., Armsworth, P. R., Ash, N., Beddington, J., ... & Godfray, H. C. J. (2009). Biodiversity conservation and the millennium development goals. *Science*, *325*(5947), 1502-1503.

Safa, M. S. (2006). The role of NGOs in improving social forestry practice: Do they promote livelihood, sustainability and optimal land use in Bangladesh?. *Small-scale Forestry*, *5*(2), 207-229.

Sen, S., & Nielsen, J. R. (1996). Fisheries co-management: a comparative analysis. *Marine policy*, *20*(5), 405-418.

Sen, A. (1997). Editorial: Human capital and human capability. *World Development*, 25(12): 1959-1961.

Schlager, E., & Ostrom, E. (1992). Property-rights regimes and natural resources: a conceptual analysis. *Land economics*, 249-262.

Shindler, B., & Aldred Cheek, K. (1999). Integrating citizens in adaptive management: a propositional analysis. *Conservation Ecology*, *3*(1).

Sheppard, S. R. J. and Achiam. C. M. (2004). Public participation in forest decision making. *In* Encyclopedia of forest sciences. J. Burley (editor). Elsevier Science Ltd., Oxford, UK. pp. 1173–1182.

Sherwood, D. B. (2009). Community-Based Wetland Comanagement in Bangladesh.

Shewli, S. B. (2008). The role of women in co-management at Lawachara National Park. *Connecting communities and conservation: Collaborative management of protected areas in Bangladesh. USA: United States Agency for International Development (USAID)*, 275-290.

Songorwa, A. N. (1999). Community-based wildlife management (CWM) in Tanzania: are the communities interested?. *World Development*, *27*(12), 2061-2079.

Stevens, S. (1997). *Conservation through cultural survival: Indigenous peoples and protected areas*. Island Press.

Steel, B. S. (1996). Thinking globally and acting locally?: environmental attitudes, behaviour and activism. *Journal of environmental management*, *47*(1), 27-36.

Subhani, R. (2008). Impacts of co-management activities on women members of forest user groups in Satchari National Park. *Connecting communities and conservation: Collaborative management of protected areas in Bangladesh. USA: United States Agency for International Development (USAID)*, 231-250.

Sultana, P., & Thompson, P. (2008). Gender and local floodplain management institutions: A case study from Bangladesh. *Journal of International Development*, *20*(1), 53-68.

Sutherland, W. J. (2006). Predicting the ecological consequences of environmental change: a review of the methods. *Journal of Applied Ecology*, *43*(4), 599-616.

Thompson, P. M. (2008, July). Conserving and restoring the benefits from Bangladesh wetlands. In *Proceedings of the 12th Biennial Conference of the International Association for the Study of Commons: Governing Shared Resources: Connecting Local Experience to Global Challenge. Cheltenham* (pp. 14-18).

Thompson, P. M. (2013). Sustainability of community-based organizations in Bangladesh. *Society & Natural Resources*, *26*(7), 778-794.

Todaro, M., & Smith, S. (2003). Development economics. 8th ed. Boston, MA: Addison Wesley.

Tremblay, M. A. (2013). The Key Informant Technique: A Non-ethnographic Application. Retrieved from http://classiques.uqac.ca/contemporains/tremblay_marc_adelard/Key_informant_technique/Key_informant_technique.pdf

Uddin, M. Z., & Hassan, M. A. (2010). Angiosperm diversity of Lawachara National Park (Bangladesh): a preliminary assessment. *Bangladesh Journal of Plant Taxonomy*, *17*(1), 9-22.

Uddin, M. S. (2011). Role of Microcredit and Community- Based Organizations in a Wetland Area in Bangladesh (Unpublished masters thesis). Natural Resources Institute, University of Manitoba, Winnipeg, MB, Canada.

UNDP. United Nations Development Program. (2008). Human Development Report. Retrieved on January 2017 from http//hdr.undp.org/en/countries.

Usadolo, S. E., & Caldwel, M. (2016). A Stakeholder Approach to Community Participation in a Rural Development Project. *SAGE Open*, *6*(1), 2158244016638132.

Western D., & Wright, M. (1994) *Natural Connections: Perspectives in Community-based Conservation.* Washington, D.C.: Island Press.

Wilcox, D. (2003). The guide to effective participation. Retrieved from http://www.partnerships.org.uk/guide.

Wily, A. L. (2002). Participatory forest management in the United Republic of Tanzania. Paper presented at: Second International Workshop on Participatory Forestry in Africa; 18–22 February 2002; Arusha, Tanzania.

World Bank. (1996). *The World Bank participation sourcebook*. Washington, DC: Author.

Winrock, 2007. Management of Aquatic Ecosystems through Community Husbandry (MACH) completion report, Vol. 1 Main Report. Winrock International: Dhaka.

World Bank (1996) *Identifying stakeholders* In The World Bank Participation Sourcebook. [WWW] URL: http://www.worldbank.org/wbi/sourcebook/sb0302t.htm.

Woodhill, A. J. (2004). Dialogue and transboundary water resources management: towards a framework for facilitating social learning. *The role and use of information in European transboundary river basin management. IWA Publishing, London*, 44-59.

Xu, D., Zhang, J., Rasul, G., Liu, S., Xie, F., Cao, M., & Liu, E. (2015). Household livelihood strategies and dependence on agriculture in the mountainous settlements in the Three Gorges Reservoir Area, China. Sustainability, 7(5), 4850-4869.

Yeasmin, L. (2012). *Role of Green Micro-credit in Creating Livelihood Options and Women's Empowerment in a Bangladesh Wetland* (Unpublished masters thesis). Natural Resources Institute, University of Manitoba, Winnipeg, MB, Canada.

Yin, R. K. (2009). *Case study research, design and methods.* 4 edi., London, United Kingdom: Sage Publication.

Yin, R. K. (2014). *Case Study research, design and methods*, 5th edi., London, United Kingdom: Sage Publication.

Yin, R. K. (2013). *Case Study research, design and methods*, 5th edi., Sage Publication, London, United Kingdom.

Zaman, S., Siddiquee, S. U., Al Faruq, M. A., Pramanik, M. R., & Katoh, M. (2011). Reckoning participatory forest management in Bangladesh: Study from its implementation perspective. *Journal of Agricultural Science*, *3*(3), 233.

Appendix i

Guided questions for semi-structure interviews

1. To what extent do you care about forest?
2. How do you view/perceive conservation intervention?
3. Do you welcome it?
4. Do you expect any positive change from it?
5. Do you participate in the management practices?

    If yes: (i) What are the underlying motives?

    (ii) Is there any incentives?

    (iii) Is there anyone motivate them to participate?
6. If not why?
7. How do you or your family used to use forest resources before intervention?
8. How did the intervention change your livelihood practices?

    (i) If positive (from their perspective) then how?

    (ii) If negative, then how?
9. How do you cope with the change? Do they create space for them within the current practice? Or do they want to go beyond that?
10. How intimate are you with the project?

Appendix ii

Key Informant Interviews

(Local people, Farmers and Fishers)

Sources of Livelihoods

1. What are the main sources of livelihoods of your families? Please tell me about the livelihood activities you follow throughout the year. How do you change your livelihood options from monsoon season to dry season?

2. What are the main sources of livelihoods of most families in your community? Please tell me about the livelihood activities that they follow throughout the year. How do they change livelihood options from monsoon season to dry season?

3. What are the alternative sources of your livelihoods? Do you practice duck/cow rearing, nursery plantation, homestead gardening, etc.? Can you practice these throughout the year?

4. What are the alternative sources of livelihoods of other members of your community?

5. For what resources are you and your family dependent on the flooded forest and other aquatic resources? What is the major use of forest trees in your family/household?

6. For what resources are your community members dependent on the flooded forest and other aquatic resources? What is the major use of forest trees in your community?

7. What is the major use of trees while fishing/farming? Is it possible to substitute with some other things? In which season fishing/farming/collecting NTFP is easier? Why?

SFRS Project and Forest Restoration

1. Do you know about the organizations working in your village? Do you feel easy and comfortable to go to these organizations to discuss any livelihood issues or disputes? Are the Organization (NGO, others) members friendly to you? Have you got any positive response from them?

2. Do you know about the SFRS project? Have you worked with them in forest restoration activities? Have you participated in any activities (like plantation program, monitoring of seedlings, etc.) with the SFRS project?

3. Are you a member of Community Based Organization (CBO)? If yes, how long have you been working with them? What have you learnt, in terms of livelihood security and forestry management, from working with them?

4. Please explain the nature of your participation. What factors have facilitated your engagement? What factors have constrained your participation?

5. Do you know about Project Implementation Committee (PIC)? Have you ever worked in a PIC? What responsibilities did you have performed? What is your experience to work in a group like PIC? Is it easier to take decisions/solve problems (for example what species should be planted) being in a group?

6. Do you think SFRS project has any impact, ***positive*** and/or ***negative,*** in your livelihood improvement? If yes, what they are? What new things have you learned from SFRS project that you did not practice before (for example: homestead gardening or nursery plantation)?

7. Please explain about the alternative livelihood approaches (e.g. vegetable gardening, making *shital pati* etc.) you learned from SFRS members. Do you practice these in your daily life? Do you find them helpful in increasing your livelihood options?

Human and Social Capital

1. Do the SFRS members provide any training prior to working with them as preparatory measures? If yes, what types of training do they provide? Are these training helpful for working in flooded forest management with them?

2. What have you learnt from SFRS project about maintenance and improvement of livelihood (for example, modern and intensive farming/fishing techniques)? Have you used these skills and knowledge in your improving your livelihood? How do these learning help you in having a better life? Do you share your knowledge with your neighbors/ other people?

3. Do you think your organizational skills (ability of working in a group or individually, decision making, problem solving, teaching/training others) has improved by working with the SFRS members? Can you teach others what you have learned from SFRS project?

4. Do you know if there are any rules and regulations about fishing or farming (like fishing limit or restrictions of access to forest resources)? Do you follow these rules and/or regulations? Do other community members follow these rules and/or regulations?
5. Are there any social groups (such as *Samaj* or Society) among the community members and/or in your village? Are there groups based on religion or political party? If yes, which one is dominating the others? How the dominating group subjugate the others?
6. Do you enjoy working in a group with SFRS members and other local people? What are the challenges working in a group? Do you have a healthy relation with all the other CBO members?

7. What do you gain from working with the community people? Do you share with others to address your problems (for example crop damage or failure because of a disease)? Is it easier to solve the problems together?

8. Do you always attend CBO meetings and discuss your problems? What kind of issues do you generally discuss? Do you think the meetings are fruitful for you? How?

9. Do the community members attend CBO meetings willingly and discuss their problems? What kind of issues do they generally discuss? Do you think the meetings are fruitful for them? How?

Natural Capital and local perception regarding flooded forest

1. In your opinion, how well the flood forests was managed by the authorities in the past (prior to SFRS project)?

2. Has the flooded forest been expanding or declining since the commencement of SFRS project?

3. How can the forest be managed by the local people after the SFRS project is completed?

4. Do you encourage your sons/daughters and/or neighbours to preserve the flooded forest? Can you suggest some ideas or plans to put forward the restoration project by engaging the young generations?

Sense of ownership

1. Do you practice fishing/farming/Non Timber Forest Products collection in your own land?

2. What proportion of land is privately owned in your community? How do you recognize your own land when they are under water during the monsoon season? Can others access your property when they are under water?

3. Are you aware of the benefit sharing process in the SFRS project? Are you happy with your sharing portion? Why/ why not?

4. Do you like the traditional leasing system? How do you manage to catch fish/ other aquatic resources (waterlily for example) from common areas under this system? What are the benefits as well as challenges in present leasing system?

5. What is your opinion about the present leasing system? Please tell me in details how you use flooded forests and other wetland resources under the present leasing system?

6. Who are the beneficiaries of the SFRS project at present time? Is there any outside community that take benefit from that project? Have you (the community people) discussed (or made a plan) to manage the flooded forest after the completion of SFRS project?

(AF and CNRS Officials)

SFRS project and Livelihood Diversification

1. What are the diverse livelihood activities generated by SFRS project? Do the community people practice these in their every-day life?

2. How the SFRS project is restoring flooded forest as well as developing livelihood option/activities for local people at the same time? What are the factors that constrain the SFRS project in forest restoration as well as improve livelihood conditions?

3. What is the difference between CBO and PIC? How do you form CBOs and PICs? What criteria do you apply in selecting beneficiary member while forming these organizations/groups?

4. Do the local people show interest to work with the project? If they do, ho do they express such interest?

Human, Social and Natural Capital and Context of Vulnerability

1. What are the major shocks (floods, storm or civil conflict) you confront generally? How do you manage/adapt with these shocks?

2. What kind of improvement do you observe in local people's livelihood activities over the years (since SFRS started)?

3. How have they improved in managing natural and other shocks and stresses (floods, storm, crop damage or failure, death of livestock etc.)?

4. How do you ensure equal participation of local people in SFRS project? What are the challenges to work with these local communities? What are the advantages and disadvantages of working with these local communities?

5. Do you face any conflict among the community members/ between the SFRS members and the local people? How do you manage such conflicts?

6. Are there any social groups (such as *Samaj* or Society) among the community members? Or any group based on religion or political party? If yes, how do you manage to work with different groups? What are the challenges in such cases?

7. Do all the members of CBO attend the monthly meetings? What issues do they discuss generally?

8. What is your assessment of their (local community members) capacity in solving livelihood problems, learning money management as well as better decision making?

9. Do you provide any training after forming CBO and PIC? What kind of training do you provide? Is there any special training for the illiterate person (someone who cannot read and write)?

10. Are the local people able to learn/share the knowledge of new techniques, once SFRS members train them?

11. What kind of change do you see in people's perception/ attitude towards flooded forest restoration? Do they know that the forest should be preserved for themselves? Do they participate spontaneously in CBOs and PICs?

12. Are there any organization other than CNRS and Arannayk Foundation working in this locality on flooded forests? If this is, do you know about their activities (their roles and responsibilities towards the community)? Have CNRS or Arannayk Foundation ever collaborated with these organizations?

13. Do you still experience illegal logging of trees or encroachment of forest land by the local people? How do you manage such problems? Do you take any legal actions against them?

Sense of ownership and policy implications

1. How the land is divided among the local people and the government *khas* land? How people access their under-water land? Can other people access under-water land during the monsoon season? How the forest restoration program function during this time?

2. Do you practice forest restoration only on the government land or also on private land ? How do you decide where to plant forest trees? Do the local people give their consent for plantation? Do you face any conflict in such situations? How do you manage such problems?

3. What type of activities (nursery plantation, homestead gardening, tree plantation) are practiced on the private lands? Are the resources on private land shared with other villagers? If yes, how the benefits from these resources are shared?

4. What are the factors (for example limited fund or lack of Government support) that limit the SFRS project in forest restoration? How do you deal with these problems?

5. Do you have any rules and regulations regarding flooded forest restoration (e. g. what species and how many species should be planted, which time the plantation should be started)? Are these rules made by both CNRS and Arannayk Foundation? Do you always follow the rules?

6. What policy do you follow the rules and regulations in SFRS project? Do you suggest any policy prescription or direction regarding flooded forest restoration? (should be asked at HQ)

Traditional Lease Holder

Leasing system and ownership issue

1. How do you get control over the resources as a lease holder? Please tell me about the process in the leasing system that you had to go through for getting the lease?

2. Please explain about the leasing system of wetlands and other aquatic resources as well as flooded forest. Is the leasing period fixed? How long is that? What are the rules and regulations of using wetland resources for the local people?

3. How the local people are classified in groups to use wetland resources according to this system? What is your opinion about the impact of the present system? Do they cause harm or bring about benefits to the local people? How?

4. Is there any limit in resource use (for example fishing limit) in leasing period? How do you fix the limit in accordance with various size of families?

5. Does any group dominate in resource extraction in the leasing system? If yes, who are they? How the leasing system can further be improved?

Deputy Commissioner of Sunamganj

SFRS project and Flooded Forest restoration

1. What role does the SFRS project play in flooded forest restoration and livelihood diversification of local community?

2. Do you observe any change of community people in terms of improving livelihood activities and forest management since the commencement of SFRS project? What has been the impact of the project – in terms of harm and/or benefit? How?

3. Do you know if there are any rules and regulations followed in SFRS project? Is Government involved with CNRS and Arannayk Foundation in making these rules and regulations? If yes, how?

Leasing system and ownership issue

1. How do you choose the lease holders? What requirements the lease holders should fulfill? Do the local people have any voice in selecting the lease holder?

2. Please explain about the leasing system of wetlands and other aquatic resources as well as flooded forest. How do you fix the rules and regulations for local people regarding resource use and how do you ensure all the people to get equal benefit from the leasing system?

3. What are the responsibilities of a lease holder? Do they follow any specific rules made by government? Is there any written agreement between the lease holder and the government? What happens if the lease holder breaks the rules?

4. If a person/a family/a group of people face difficulties (or get confused) regarding resource use under the leasing system, where and how could they get justice?

5. If the local people feel deprived and have a complaint against the lease holder, what should they do?

6. Is there any conflict between the lease holder and the local people? If yes, how these conflicts are addressed by the government?

Appendix iii

Focus Group Guiding Questions

1. What are the main sources of livelihoods of your families? Please tell me about the livelihood activities you follow throughout the year.
2. What are the alternative sources of your livelihoods of your families? Do you practice the SFRS introduced alternative livelihood sources in your daily life? Do you find them helpful in better livelihood management?
3. For what resources are you and your family dependent on the flooded forest and other aquatic resources? What is the major use of forest trees in your families?
4. What are the major shocks and vulnerability (floods, storms etc.) you face in your livelihood management? How do you cope and adapt with these vulnerabilities?
5. Do you know about all the organizations working in your village? Do you feel free to go to these organizations for solving any livelihood issues? Are the members friendly to you? Do you get benefit from them?
6. Do you think SFRS project has any impact, ***positive*** and/or ***negative,*** in your livelihood improvement? If yes, what they are? What role the SFRS project plays that help you adapt with the shocks and vulnerability?
7. How do you learn new techniques from the SFRS members? Do they provide any kind of training? If yes, are these training helpful in your livelihood management? How?
8. Have you ever worked in CBO or PIC? What have you learned working with the project?
9. Do you always attend CBO meetings and discuss your problems? What kind of issues do you generally discuss? Do you think the meetings are fruitful for you? How?
10. What is your opinion about the present leasing system? Please tell me in details how you use flooded forests and other wetland resources under the present leasing system?
11. Do you think the forest management should be continuing for the long-term sustainability of your livelihoods? How can you do that? How can the forest be managed by the local people after the SFRS project is completed?

Appendix iv

Household Survey Questionnaire

Date: _____ Village: _____

Household ID: _____ Name: _____

Respondents(s) age and sex: _____

Respondents will be requested to circle their answers.

Household Information

1. How many people are there living in your household?
2. Is the household head male or female? a. Male b. Female
3. Total no. of children in your household:
4. Total no. of children attending school:
5. If children are not attending school, what is the reason?
6. How long have you and your family been lived in this village?
7. How long you intend to stay in this village?

Sources of income, livelihood strategy and social bond

8. What are the primary activities for your livelihood management?
9. If you had an opportunity, would you accept a job elsewhere? A. Yes B. No
10. If yes, what type of job? Where and why?
11. Do you have family or friends in this village that help your household? A. Yes B. No
12. If yes, what type of help do you get from them? A. Money B. Food C. Other (specify)
13. How often do you get this support? A. Daily B. Once/Week C. Once/Month D. Other (specify)

14. Do you have family or friends in other parts of the country that help your household?

A. Yes B. No

15. If yes, what type of help do you get from them? A. Money B. Food C. Other (specify)

16. How often do you get this support? A. Daily B. Once/Week C. Once/Month D. Other (specify)

17. Do you help family or friends in this village? A. Yes B. No

18. What type of assistance do you provide them? a. Money b. Food c. Other (specify)

19. How often do you get this support? A. Daily B. Once/Week C. Once/Month D. Other (specify)

20. Does any member of your household participate in meetings/training programs of SFRS Project? A. Yes B. No

Food Intake Pattern

21. What food do you use for your home consumption?

22. Which products do you produce for home consumption (within your family)?

23. Which products do you buy from the market?

24. If you produce rice during the dry season, can you consume it throughout rest the whole year? A. Yes B. No

25. How long can you consume the rice you produce during the dry season?

26. Do you have surplus stock of rice/wheat/paddy for future use? A. Yes B. No

Assets, savings and loans/credits

27. 1. Do you have your own house? A. Yes B. No

28. Do you have any savings? A. Yes B. No

29. If yes, where?

30. Total amount of saving in Tk:

31. How many NGOs are you engaged with?

32. From what sources do you to take loans

33. For which purposes do you take loans?

Household Survey Questionnaire (Women Engagement)

Socio-demographic profile of households

1. Occupation
    a. Main source of earning

    b. Other:

2. Formal years of education

3. Age

4. Sex

5. Religion

6. How long have you been living in this area (community)?

    i) First generation ii) Second generation iii) Third generation iv) local people

7. Family members

Male	Female
Total	

8. Earning members

9. Remittance (BDT/Year)

10. Sources of income

Name of the sources	Income in taka/yearly

11. Land ownership (amount and current market value)

Land ownership		
Agricultural	Amount (Decimal)	
	Current market value (BDT)	
Non-agricultural land	Amount (Decimal)	
	Current market value (BDT)	

12. Property (moveable)
13. Property (Women)

Perception on resources conservation practices

1. To what extent do you think this project is likely to secure your livelihood?
    a. Very high
    b. High
    c. Moderate
    d. Low
    e. Very low
2. To what extent do you think this project will be beneficial for conserving forest resources (if not restoration)?
    a. Very high
    b. High
    c. Moderate

d. Low

e. Very low

3. Do you think this project was necessary for forest conservation?

   a. Yes

   b. No

4. To what extent did you dependent on forest resources before project intervention?

   f. Very high

   g. High

   h. Moderate

   i. Low

   j. Very low

5. Do you participate in the resources management practices?

   a. Yes

   b. No

Explain why?

6. How intimate are you with the project?

   a. Very high

   b. High

   c. Moderate

   d. Low

   e. Very low

7. Do you think current management practice is consistent with your livelihood practice?

   a. Yes

   b. No

8. Do you think current management practice is consistent with your societal values?

c. Yes

d. No

9. Do you think current management practice is consistent with customary resources conservation practices?

e. Yes

f. No

Appendix v

UNIVERSITY OF MANITOBA | Research Ethics and Compliance
Office of the Vice-President (Research and International)

Human Ethics
208-194 Dafoe Road
Winnipeg, MB
Canada R3T 2N2
Phone +204-474-7122
Fax +204-269-7173

APPROVAL CERTIFICATE

June 24, 2016

TO: **Farjana Ferdous** **(Advisor: C. Emdad Haque)**
Principal Investigator

FROM: **Lorna Guse, Chair**
Joint-Faculty Research Ethics Board (JFREB)

Re: **Protocol #J2016:026 (HS19600)**
"Flooded Forest and Livelihoods of the Local Community in Jamalganj, Bangladesh: Lessons Learned from a Restoration Project"

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 (2). **This approval is valid for one year only and will expire on June 24, 2017.**

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

Please note:

- **If you have funds pending human ethics approval, please mail/e-mail/fax (261-0325) a copy of this Approval (identifying the related UM Project Number) to the Research Grants Officer in ORS in order to initiate fund setup. (How to find your UM Project Number: http://umanitoba.ca/research/ors/mrt-faq.html#pr0)**

- **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 University of Manitoba may request to review research documentation from this project to demonstrate compliance with this approved protocol and the University of Manitoba *Ethics of Research Involving Humans*.

The Research Ethics Board requests a final report for your study (available at: http://umanitoba.ca/research/orec/ethics/human_ethics_REB_forms_guidelines.html) **in order to be in compliance with Tri-Council Guidelines.**