
People's Livelihoods and Involvement in Co-management of Madhupur National Park, Bangladesh

Rokeya Begum¹

Abstract

Natural forests in Bangladesh have been severely degraded due to over exploitation, encroachment, fire, uncontrolled and wasteful commercial logging, illegal felling, overgrazing, and the collection of fuelwood to support the energy needs of a large population. In 2003 the Forest Department (FD) with assistance from the United States Agency for International Development (USAID) launched the Nishorgo Support Program (NSP) to test a participatory co-management approach to protected area (PA) management. The project lasted until 2007 and was followed in 2008 by the Integrated PA Co-management (IPAC) project with the aim of improving local people's livelihoods through greater access to and control over local forest resources. This paper investigates the livelihoods of local people in two villages and their involvement in management of Madhupur National Park. Based on data collected between September and December 2009 I argue that farmers in the study area are heavily dependant on forestry-related activities to support livelihoods. Residents of both villages have a long history of participation in outside-initiated social forestry programs, and farmers have become suspicious that these programs may not provide the benefits promised, may limit their access to forest resources, and may exacerbate long standing conflicts with the FD. Moreover, despite their history with these programs, many people have little knowledge of co-management. In this paper I conclude that potential exists for various alternative income generating (AIG) activities that could help improve the livelihoods of the local people and the management of Madhupur National Park.

Introduction

A livelihood comprises the capabilities, assets 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 (Carney 1988).

Many of the world's protected areas (PAs) are important not only for their biodiversity, but also for their natural resources that many local people rely on for their livelihoods (Falconer and Arnold 1989, Cavendish 2000). Many people believe that without the active involvement of local people in park management and increased economic incentives for their collaboration in conservation, there is little chance for PAs to be conserved and local resources to be sustainably managed. People also argue that the conservation of biodiversity in PAs will be more

challenging if local communities are heavily dependent on these areas for energy, nutrition, medicine, and other subsistence needs (Masozera and Alavalapati 2004). Biodiversity conservation planners need to take into consideration the needs of local people, presence or absence of income sources, livelihood issues, and dependence on the forest and forest resources. In the context of Bangladesh, it is very difficult to involve local people in conservation efforts without providing them with some direct and tangible benefits - either benefits in kind or cash for their involvement.

Natural forests in Bangladesh have been severely degraded due to over exploitation, changes in land use, encroachment on forestlands, fire, uncontrolled and wasteful commercial logging, illegal felling, grazing, and the collection of fuelwood to support the energy needs of a large population. The total forest area affected by encroachment in Bangladesh is estimated to be about 36,000 hectares (Haque 2007). It is estimated that approximately 1,000,000 people in Bangladesh live and farm on encroached land (Haque 2007). As a result of these various factors the Sal forests of central and northern Bangladesh have been seriously depleted. Conventional forest management without the participation of local people has not succeeded in curbing deforestation and forest encroachment. I argue that to save Bangladesh's forests and their associated biodiversity, it is imperative that we reduce the dependence of local people on forests and bring them into the mainstream of management. I base my argument on data collected between September and December 2009 in Madhupur National Park.

Bangladesh has a long history of community involvement in forest management. As early as 1871 tribal *jhum* (swidden) farmers in the Chittagong Hill Tracts were engaged in the planting of teak trees (*Tectona grandis*) in abandoned dry land fields under the *taungya* system. In the 1980s, the Forest Department (FD) used funding from the Asian Development Bank (ADB) to initiate the Community Forestry Project in twenty three districts of the northern part of the country as a social forestry project, the first of its kind in Bangladesh. Under this project, marginal fallow lands (road and rail embankments) were converted from bare or cultivated land into forest. Local people were involved and became responsible for the care and maintenance of plantations in return for a share of profits from the mature crops.

This initial program was a great success and marked a milestone in participatory forestry in Bangladesh. Successively, more participatory projects were also implemented. In 1995, the government approved the twenty-year Forestry Sector Master Plan (FSMP) for the protection and development of the country's forest resources. Similarly, the ADB-assisted Forestry Sector Project (FSP), which lasted from 1997-2006, encouraged afforestation activities on marginal lands belonging to various land owning agencies of the government. FSP paid local people for their involvement in the care and maintenance of tree plantations through a share of the tree thinning and pruning materials. The FSP also paid a handsome amount of money from sale proceeds based on a Participatory Benefit Sharing Agreement (PBSA). Under the FSP participants also received money on a daily basis from the FD for labor they contributed to plantation activities. The project covered sixty-four districts including seven PAs (Mukul *et.al* 2008).

Co-management or collaborative management is defined as a "situation in which two or more social actors negotiate, define and guarantee amongst themselves a fair sharing of the management functions, entitlements and responsibilities for a given territory, area or set of natural resources" (Borrini-Feyerabend *et al* 2000). The Bangladeshi government adopted its first co-management program for natural resources, the Management of Aquatic Ecosystems through Community Husbandry (MACH) project, to restore the productivity of three major wetlands between 1998 and 2007.

In 2003, the FD launched the Nishorgo Support Project (NSP) with assistance from the United States Agency for International Development (USAID) to test a participatory co-management approach to PA management. The NSP broadly covered five PAs in Bangladesh (Lawachara National Park, Rema-Kalenga Wildlife Sanctaury, Satchuri National Park, Chunoti Wildlife Sanctaury and Teknaf Game Reserve) and lasted until 2007. NSP officials worked closely with the FD personnel and key conservation stakeholders to develop and implement a co-management strategy to help conserve the country's PAs. The focus of the NSP was on building equitable partnerships between the FD and key local, regional, and national stakeholders to assist in the conservation of Bangladesh's PAs (GOB 2007).

In 2008, the FD and USAID started the Integrated Protected Area Co-management (IPAC) project in 17 PAs and one eco-park in Bangladesh with the aim of improving local people's livelihoods through greater access to and control over local forest resources. IPAC project officials work with personnel in the FD, the Department of Fisheries (DoF), and the Department of Environment (DoE) to: 1) provide support to sustain success in biodiversity conservation and alternative income generating (AIG) activities at NSP and MACH pilot sites; 2) expand and support development of an integrated strategy and coherent national program to support co-management and environmental governance; and 3) mitigate and adapt to climate change (Sharma *et al.* 2006).

Madhupur National Park is one of the PAs associated with the IPAC project. To achieve the objectives and apply the activities of the IPAC in Madhupur National Park it is necessary to understand the existing livelihood conditions and involvement of local people in the PA. The goal of this paper is to contribute to our understanding of the livelihoods of local people and their involvement in forest management at Madhupur National Park.

Background

Madhupur National Park is located in Tangail District, 125 kilometers north of Dhaka on Tangail-Mymensingh Road. The park is located in the northeastern part of Tangail Forest Division along the boundary with Mymensingh District (it also extends slightly into the district). Madhupur National Park is located in three *upazillas* (sub-districts): Madhupur Upazilla in Tangail District and Muktagacha and Fulbaria Upazillas in Mymensingh District. Major parts of the park are under the administrative jurisdiction of Tangail Forest Division and a small portion is under the

jurisdiction of Mymensingh Forest Division.

Madhupur National Park began as Madhupur Sal Forest, but was finally declared a national park in 1982, although calls for national park status began as early as 1962. Madhupur National Park, which is also known as Madhupur Garh (*garh* meaning 'fort'), comprises an area of 45,565 acres, of which 2,525 acres are reserved forest though gazette notification, and the remaining 43,039 acres are in the process of being declared as reserved forests. A total of 44,533 acres have been surveyed. Madhupur National Park has four ranges, ten beats, and one nursery center (IPAC 2009).

Madhupur National Park is part of the tropical moist broadleaf eco-region of Bangladesh and eastern India. Historically, these tropical moist deciduous forests stretched along the lower reaches of the Ganges and Brahmaputra river plains across the Indian states of Bihar, West Bengal, Assam, Uttar Pradesh and Orissa, and most of Bangladesh. Madhupur National Park forms a slightly elevated tract not exceeding 20 meters in height above the surrounding land. The ridges, locally known as *chala*, are not continuous and are covered with forest formations. Numerous depressions with gentle slopes intercept the ridges. These depressions, commonly known as *baid*, are cultivated for growing rice (CEGIS 2008).

The main forest tree species in Madhupur National Park is sal (*Shorea rubusta*). Formerly the area was very rich in flora and fauna and had populations of elephants and different sub-species of Indian tigers, bears, and birds. Most of these mammals are now locally extinct. Remaining fauna species include monkeys, deer, and langur. Floral species include *haldu*, *korai*, *satain*, *ronia*, *kadam dewa*, *neem*, and *shimul*. According to the locals, massive geo-physical changes have occurred over the last twenty years with rapid and almost complete deforestation of the forest (GOB 2006).

Despite its status as a PA, people continue to depend upon Madhupur National Park's forests for natural resources. Forest stakeholders include *moholder* (auctioneers); illegal tree fellers; collectors of fuelwood, honey, bamboo, cane, sun-grass, fruits, and medicinal plants; hunters and trappers; and farmers who grow pineapples, bananas, papayas, lemons, and other crops in the forest. Many villagers are entirely dependent on the forest for fuelwood and building materials, the collection of which often involves illegal tree felling.

Several mosques, Hindu temples, and churches are also located in the park. About nineteen non-governmental organizations (NGOs) are active in the park, with many providing credit for small businesses such as livestock rearing. NGO micro-credit programs usually focus on supporting activities for women. A government bank also functions in the park making micro-loans for income generating activities such as agriculture and handicrafts to assist in poverty reduction.

Approximately 113 villages surround Madhupur National Park with a combined population of 28,513 households consisting of 124,575 inhabitants, of which 63,678

are male and 60,897 are female (IPAC 2009). Park inhabitants include members of Muslim, Hindu, and Christian religions (Garo, Bormon and Koch) (IPAC 2009). Most natural forests in Bangladesh are home to ethnic minorities who intensively manage forests as PAs in order to retain natural vegetation, forest tree cover, and tribal-forest associations. During the Liberation War, freedom fighters used Madhupur National Park and the surrounding sal forests as a base area. The FD has overall responsibility for the management, conservation and development of Madhupur National Park through planting, patrolling, and guarding forest resources. While the number of FD personnel is inadequate for the management of Madhupur National Park forests, the agency plays a positive role in the protection of the forest range.

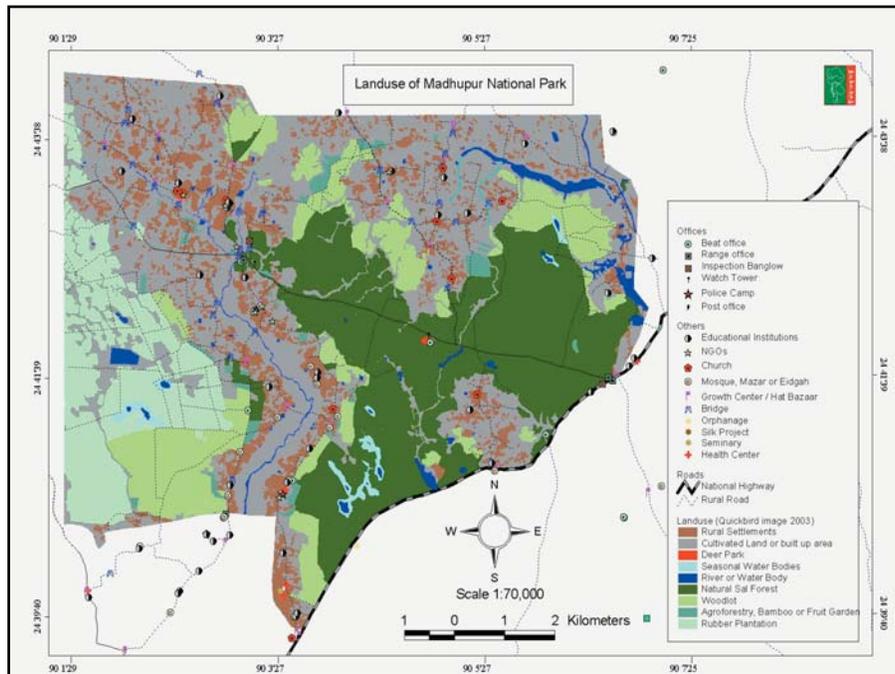


Figure 1: Land-use map of the study area

Research objective and questions

The overall health of Madhupur's sal forest is extremely poor. The forest is greatly disturbed by human activities such as encroachment and illicit tree felling has been tremendously accelerated due to population pressure and privately owned agricultural lands within the reserve forest. There is a serious crisis related to supplies of domestic fuelwood. The local Garo (Mandi) community has been living in the forest area for well over a hundred years, and their livelihoods depend heavily on the forest. The Garo community believes that the forest belongs to them, and that they need access to it to support the needs of their growing population for more

agricultural land. This has caused a serious conflict between the FD and Garo community in Madhupur National Park over land and forest use rights. FD personnel have tried to implement several management practices in the past, but these attempts have faced strong protest from members of the Garo community who fear that these activities will harm their rights to use land and forest resources. In another example of conflict, the FD tried to develop an eco-park in the area and constructed a boundary wall for wildlife habitat. The project failed, however, due to obstruction from local residents, especially the Garo community. The local Garo leader died in this conflict during clashes with law enforcement officers in 2004.

My objective in this paper is to add to our understanding of the livelihoods of the local people and their involvement in management of Madhupur National Park. I also identify ways that local people can be better involved in forest management. The following research questions were designed to address this objective:

- What are the income sources of local people?
- Are local people dependent on forests?
- How are local people involved in forest management?
- What are the local people's perceptions of FSP projects?
- Are local people interested in co-management?

Methods

I collected primary data between September and December 2009 from two villages, the IPAC site office, forestry officials at the Madhupur National Park beat office, and key informants through personal interviews using a semi-structured questionnaire. I chose the two villages (*Pirgacha* and Telki) because of their easy accessibility and the heavy dependence of their residents on forests. In September 2009, I organized four focus group discussions with people at the IPAC site office, officials at the FD beat office, a women's group in *Pirgacha* Village, and a Garo group in Telki Village. In these discussions I sought to learn about local people's livelihoods and social conditions, their participation in FSP, their relations with the FD and their interest in co-management. I conducted two additional group discussions, one in a local tea stall in *Pirgacha* and the other at the local bazaar in Telki. In these discussions I sought to learn about the existing roles of local peoples in forest management and their perceptions of the effects of FSPs on their livelihood activities. Based on these discussions I selected four key informants based on their levels of knowledge and involvement with the community. Later I interviewed these key informants about the historical background of the area and local communities, present forest conditions, local people's dependence on forests, livelihood activities, and local people's perception of FSP affects, and the interest of local people in co-management. Key informants included two members of the local elite, a FD officer, and an IPAC staff member. I collected secondary information from various sources including the internet, journals and books, as well as official reports from the NSP, the FD and the International Resources Group (IRG).

Field research took place in two villages, *Pirgacha* and Telki. Both Bengali people and ethnic minorities (Garo) live in these two villages. Most Garos are Christians who converted from Hinduism after local missionary organizations provided local people with education and sanitation facilities. In addition to these missionary organizations, various NGOs and a government bank work to develop the livelihoods of local people.

In order to select households for interviews I prepared community maps of the two villages through group discussions with community members. I then developed a community profile for each village to investigate household livelihood strategies. I also prepared a household livelihood profile through discussion with community leaders, key informants, and focus groups. In addition, I confirmed information on community maps through two transect walks in the villages, during which I observed resources and livelihood activities.

Pirgacha sits about six to seven kilometers from the Dokhola Range Park Office. The village has three hamlets (*para*): Purba Para, Bormon Para, and Mission Para. The IPAC project is developing a Village Community Forum (VCF) in the village. Almost every household has a tube well and slab latrine, perhaps due to development interventions by Christian missionaries. The village has a total population of 1,042 people (516 males and 526 females). All but three households belong to the Garo ethnic community. Out of a total 279 households, I used a systematic sampling process to select fifty-five households (52 Garo and 3 Bengali) from three paras. Twelve of the households are located in Purba Para, thirty-three in Bormon Para, and ten in Mission Para. After interviewing the first household in each para I conducted additional interviews in every fifth household. For interviews I used a semi-structured questionnaire and interviewed both male and female heads of household depending on who was at home. If both the male and female head of household were available, I interviewed the male. Proposed checklists of issues were used as a basis for questions. The duration of each household interview was thirty to forty-five minutes.

Telki village lies adjacent to Madhupur National Park. Most people in the village belong to the Garo community, and in general they are poorer than those in *Pirgacha* village. The majority of households have tube wells for water and sanitation facilities. The total population of the village is 289 people (247 Garo and 42 Bengali). The total male population is 148 (Garo 124 and Bengali 24) and the female population is 141 (123 Garo and 18 Bengali). The total number of households is fifty-five (45 Garo and 10 Bengali). Out of the total fifty-five households, I selected twenty-five (20 Garo and 5 Bengali) for interviews using systematic sampling. As in Purba, I interviewed both male and female respondents using checklists of issues; each household interview lasted thirty to forty-five minutes.

I collected demographic data related to family size, primary and secondary occupations, education, and income sources using a household survey. Survey questions dealt with the respondent's background, household assets, dependence on forests resources, present management system, relationship with the FD, perceptions

of the effects of FSPs, and interest in co-management. All of the respondents were local residents, over 18 years of age, and native to the area. I also collected information on household composition, age, education, medical facilities, land and livestock holdings, toilet conditions, benefits from other organizations (banks, NGOs), sources of family income, alternative sources of fuel wood, and monthly/yearly income.

Results and discussion

Pirgacha has a total of 279 households and a population of 1,042 people (519 males and 526 females, 79 of which are children under the age of 15). I interviewed a sample of fifty-five households in *Pirgacha*. Twenty-six of my interviewees were male and twenty-nine were female. Most of the local people in my research area are Christian and the rest are Muslim and Hindu. Family sizes range from three to ten members. The average age of respondents was forty-four years old. The youngest and the oldest respondents were eighteen and seventy years old. Almost all of the households interviewed (91%) have tube wells and only 9% have dug wells. All of the households use sanitary latrines. Data from this study shows that an average of fifty-five percent of children in *Pirgacha* attend primary school, twenty-four percent attend secondary school, and twenty-one percent go to high school. Most of the respondents (92%) had *katcha* homes (mud walls with a corrugated iron roof), one household (2%) had semi-*pacca* homes (brick walls with a corrugated iron roof) and three households (6%) had tin sheet homes (walls and roof are made of corrugated iron sheets). I found that in my sample, forty-two households were male-headed and thirteen households were female-headed. Approximately 30% of households have cows, 36% have goats, 76% have poultry and 2% have pigs. All the households have access to medical facilities established by Christian missionaries. The primary income generating activities in the community are farming, day labor, forestry-related work, business, government service, and non-governmental work.

Telki Village has a total of fifty-five households and 289 people (148 males and 141 females, out of which 84 are children under the age of 15). In Telki, I interviewed twenty-five households. Fifteen households were male-headed and ten were female-headed. The majority of respondents were Christian and others were Muslim and Hindu. Families ranged in size from three to nine members. Respondents' average age was 39 years old. The youngest and oldest respondents were sixteen and sixty-five years of age. I found that 93% of households used tube well water and 8% of households used water from dug wells. All of the households have sanitary latrines. I also found that 64% of children have attended primary school, 20% secondary school, and 16% go to high school. Housing structures in Telki are *katcha* (94%) and the remaining are tin sheds (6%). In addition, 24% of households have cows, 48% have goats, 68% have poultry, and 40% have pigs.

Existing Livelihoods of the Study Villages

The livelihood conditions of local people were analyzed in terms of sources of cash income for households in the study areas. The primary source of income was defined as the income that contributed more than half of the household's earnings. Figure 1

shows that in *Pirgacha* the primary occupations are forestry-related (55%). Of the respondents in *Pirgacha*, 16% are farmers (agriculture cultivation), 9% were day laborers, 7% were engaged in business, 7% worked in the non-governmental sector, 1% are in government service, and 5% are engaged in jobs under the category of 'other', which includes van driver, truck driver, blacksmith, grocer, hotel owner, and a variety of other occupations. In Telki Village, forestry-related activities were the most important primary source of cash income. Another twenty-percent of respondents depended on farming and eight-percent were day laborers.

For the household survey (Table 1), I categorized the households into four different income classes based on monthly income: extremely poor (<1,999 BDT (28.70 USD)), poor (2,000-4,999 BDT (28.72-71.77 USD)), medium class (5,000-7,999 BDT (71.79-114.85 USD)) and rich (>8,000 BDT (114.86 USD)). I found that more extremely poor and poor people live in Telki than *Pirgacha* and that the number of medium and rich people in *Pirgacha* is higher than Telki.

Ranges	<i>Pirgacha</i> Respondents	Telki Respondents
1,999 BDT (28.70 USD)	5.5%	16%
2,000-4,999 BDT (28.72-71.77 USD)	78.2%	80%
5,000-7,999 BDT (71.79-114.85 USD)	7.3%	4%
8,000 BDT (114.86 USD)	9.0%	0%

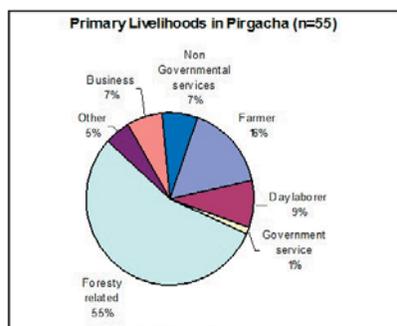


Figure 1a

Figure 1a: Primary occupations among households in *Pirgacha*

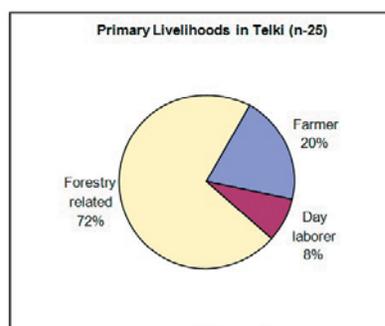


Figure 1b

Figure 1b: Primary occupations among households in Telki .

Figures 1a and 1b indicate that the majority of local people in the study area depend on natural resources for their livelihood activities. Traditionally, local people collected various resources from national park forests. People extract wood, fuelwood, bamboo, and cane from forests both to meet their household's needs and for sale as an additional income to support and supplement their livelihoods. Households in both villages have traditionally been heavily dependent on forests for their livelihoods. However, households in *Pirgacha* appear to be less dependent on forests than those in Telki. Because it is far from the national park and education levels are higher, *Pirgacha's* population is engaged in skilled occupations such as

business, office jobs, and driving vehicles. In Telki, there are only three significant job options: farming, day labor, and forestry. On the other hand, households in Telki village remain heavily dependent on the forest.

Different NGOs and banks provide micro-credit to local people for small business, livestock rearing, fish cultures, poultry, and other alternative income generating activities. Bank loans are provided in order to support income generating activities for poverty reduction and rural development. For example, banks will encourage income generating activities with seed money for agriculture and handicrafts. Most women in the study area are involved in NGO credit programs. Some of these organizations are also working on issues such as mass education, health and sanitation, and women's development. Although these organizations and activities are providing important support, respondents expressed that these activities were not sufficient to support their livelihoods.

Dependence of Households on Forests

Results from this study reveal that in the village of *Pirgacha* 82% of households engage in forestry activities inside national park forests, while 18% do not engage in such activities. Fuelwood is collected from national park forests by 75% of households for daily consumption and also for sale. The rest of the households interviewed do not collect fuelwood from the park; instead they collect fuelwood from other locations, such as their own homesteads (11%); hilly lands near the national park (7%); or at a market (7%). In addition to fuelwood, I also found 20% of households collect wood and that 18% collect fruits and leaves from forests. Approximately 36% of households own land. In Telki Village, 100% of households collect fuelwood from national park forests for both household consumption and sale. In addition, 84% collect wood and 12% collect fruit and leaves from the forest. In Telki, 32% respondents own land.

In *Pirgacha*, households in both communities depend on fuelwood for cooking due to the unavailability of natural gas and the higher prices of alternate sources of energy. The villagers also sell wood for extra income. In *Pirgacha*, forest dependence is less than Telki because they have more possible sources of income and their living standard is better than in Telki. This part of my study indicates that the level of dependence of local people on forest resources is high and that forest-related activities are the major income source for most local people. Dependence on the forest is not new; it is custom.

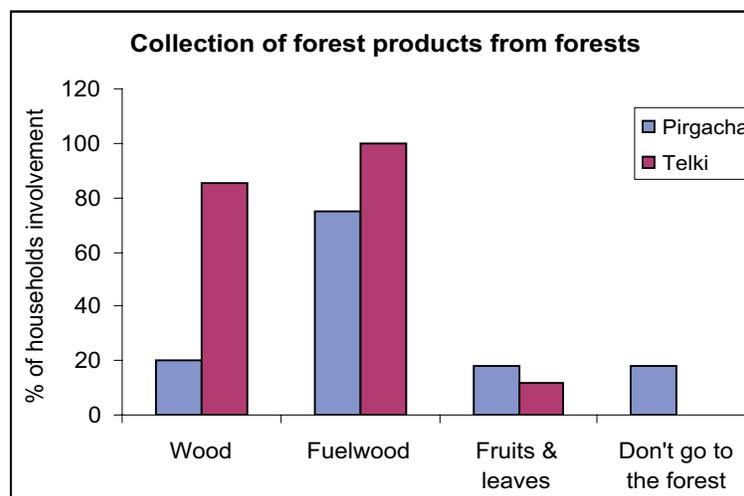


Figure 2: Percentage of households involved in forest product collection activities

Participation of Local People in Forest Management

Madhupur National Park is famous for its Sal forest. However, most of the sal forest within Madhupur National Park has been lost through illicit logging or conversion into rubber plantations. In the park, many forest lands have been encroached upon by Bangalis and ethnic minorities. In 1982, under the Thana Afforestation and Nursery Development project (TANDP) and with the assistance of the Asian Development Bank, the FD started a plantation on the present-day site of Madhupur National Park. After the project's completion in 2002, the FSP took over management responsibilities for the plantations. In order to develop the degraded natural Sal forests, 3,602 hectares of coppiced land has been brought under the authority of the FSP and is now managed with the participation of local communities. Under the Participatory Benefit Sharing Agreement, one hectare of Sal coppice was allocated to each ten participants in a group who were tasked with managing the land by employing a silvicultural system. The coppice crop was designed to be managed on a twenty year rotation cycle over sixty years with a total of three rotations. In addition to sal coppice plots, woodlots (block plantation), agro-forest lands, and buffer zone plantations were also part of the FSP.

As part of the FSP 3,904 hectares of forest (mixes of the types mentioned above) were managed by a total of 3,472 participants (2,826 of which were Bengali and 646 of which were Garo) (Table 2). Through my household survey in *Pargacha*, I found that fifty-three percent of respondents were involved in the FSP. They are part of a Participatory Benefit Sharing Agreement with the FD, and they get some benefits through selling pruned branches, the trees felled during the first thinning, the fruits of fruit bearing trees, and non timber forest products. Participants also receive cash

benefits for matured crops from FSP (Madhupur National Park Forest Department Office, *personal communication* 2009).

Table 2: FSP plantation types from 2001-2006 in Madhupur National Park

Types of plantation	Area of plantation (hectares)	Participants		
		Bengali	Garos	Total
Woodlot	1965.92	1080	293	1373
Agroforestry	827.82	782	83	865
Bufferzone	368.46	317	68	385
Sal coppices	742	647	202	849
Total area	3904.2	2826	646	3472

Local people, especially in the Garo community, expressed that they were not happy with the FSP's woodlot plantation activities in Madhupur National Park because the plantations limited their use of the forest. In the past, local people used these areas for collecting timber and various other forest products. With the creation of the FSP and the development of plantations, local people realized that their rights to use these lands would be reduced. Although some people benefited from their involvement in plantation management, many residents were not local to the area and there was political pressure from powerful elites influencing who became participants in the FSP. Local people felt that the FSP degraded their land tenure rights, and as a result they are skeptical of all development activities in the national park.

In addition, there was a lack of clarity about the objectives of the FSP and who would benefit. This led to mistrust and suspicion among local people about the FSP and the FD's role and intentions. Locals perceived access to natural forests as being more beneficial to their everyday lives than the plantations and associated activities of the FSP. Natural forests supply them with fuelwood, food, household materials, and so on. The FSP replaced some of the forests they depended on with monoculture plantations, which negatively impacted people's ability to meet their livelihood needs. Although some people earned money from the plantations, they had to wait for these benefits until the end of the plantation rotation. On the other hand, the natural forest had provided those benefits daily. The FSP ended in 2006, at which time all project activities were stopped. In this study, respondents expressed that they want sustainable development activities in Madhupur National Park and that they want to ensure that they have access to the forest to help them meet their daily livelihood needs.

Awareness of co-management practices differed between residents of the two villages in the study area. In *Pirgacha* seventy-four percent of respondents reported interest in co-management practices, while in *Telki* only fifty-two percent reported being interested. Part of the reason for this may be that at the time the IPAC project developed a Participatory Rural Appraisal (PRA) report for Madhupur National Park a Village Community Forum (VCF) had already been developed in *Pirgacha*.

Therefore, respondents in *Pirgacha* were more aware of co-management than those in Telki.

Conclusion

PAs play an important role in the conservation of forests, the maintenance of biological diversity, and the protection of ecosystem services. However, when local people are dependent on forests that lie within PAs it is important that they are actively involved in forest management. Local communities living near and within national parks often have important and long-standing relationships with these areas. In many places in the world, forest resources are important for people's livelihoods and their cultural survival (Khattak 2002). The primary purpose of this study has been to learn about the livelihoods of local people living in Madhupur National Park and better understand their dependence on the park's forests as well as their past and present involvement in the management of forest resources.

My findings show that in the villages of *Pirgacha* and Telki the primary occupations of villagers are forestry-related activities (55% in *Pirgacha* and 72% in Telki). The majority of local people in both villages are dependent on forests for their livelihoods to varying degrees. All of the households from both villages use fuelwood for cooking and almost all of the households from both villages collect their fuelwood from the national park. Given their economic status, there are few livelihood choices for residents of *Pirgacha* and Telki. According to the indicators investigated in this study, villagers in *Pirgacha* are poor and villagers in Telki are extremely poor. Therefore, prohibiting them from using forest resources without providing livelihood alternatives will have dire consequences.

Projects meant to improve the living situation in *Pirgacha* and Telki have included the Community Forestry social forestry project (1981-87) and the Thana Afforestation and Nursery Development Project (1989-1996). The principal emphasis of these social forestry projects has been increased participation of local community members in the protection and regeneration of forest resources. The largest of these projects was the Asian Development Bank's assisted Forestry Sector Project. Although some people in *Pirgacha* and Telki received benefits from the FSP, the majority were not involved. The FSP was a successful project in many respects, however it did not provide daily livelihood activities that could be sustained through time, and after the project ended so did the benefits.

Recently, Madhupur National Park was included as a new IPAC project area. The main objective of the IPAC project is the development of co-management arrangements that promote biodiversity conservation in protected areas. However, in Madhupur National Park, most of the local people do not have knowledge of co-management activities. In this paper I've shown that in a majority of residents in the study area lack interest in co-management practices. Respondents of both villages have some skepticism because of their previous experiences with the Forestry Sector Project.

In light of past and current struggles with co-management, I argue that the following issues must be considered by Madhupur National Park managers, FD officials, and future project leaders in Madhupur National Park:

- 1) Alternative income generating activities, such as cultivation of bamboo and cane, handicraft making, medicinal plant nurseries, poultry, bee cultures, and cattle rearing can help improve the livelihoods of local people.
- 2) In Madhupur National Park there is a serious fuelwood crisis. Fuelwood efficient stoves should be promoted to reduce dependence on forest.
- 3) Homestead plantation activities should be promoted to reduce dependence on national park forests.
- 4) A habitat restoration and forest rehabilitation program employing local people should be implemented to restore degraded areas in the park.
- 5) Ecotourism should be introduced by developing publicity activities (colorful posters, booklets, and postcards), eco-cottages and other tourist facilities, guide vehicles, and certified eco-guides. In this way eco-tourism could potentially become another income-generating activity for local people. However, much care must be taken with eco-tourism to ensure that local people and ethnic minorities, rather than more wealthy and connected outsiders, are the beneficiaries.

This paper provides an account of a small study of only two villages in Madhupur National Park. In order to improve park management and enable co-management, a greater understanding of local livelihoods is needed. This will require a larger livelihoods study of villages within the park. Such a study will ideally be done before another project begins, so that the next project better addresses the interests of local people. The newest project in Madhupur National Park is the IPAC project, which recently began activities geared towards improving the management of the national park. Hopefully those associated with the IPAC project can learn from the lessons of previous projects in Madhupur National Park and design a program based on the needs of local people.

Acknowledgements

I am extremely thankful to Mr. Ishtiaq Uddin Ahmed, Chief Conservator of Forests, Bangladesh for giving me the opportunity to work on and complete this case study. I would like to give special thanks to the IPAC authorities for providing me with the fellowship opportunity. I am deeply grateful to Dr. Jefferson Fox, Wendy B. Miles and Shimona A. Quazi from the East-West Center for their supervision and valuable suggestions to improve the quality of the paper. I am also grateful to Dr. M.G. Mustafa, WorldFish center, Bangladesh who supports me in developing this paper. My thanks go to Ms. Rafiq Sultana, Assistant Conservator of Forests (IPAC Project) for her cordial support to write this paper. I am thankful to IPAC site office at Madhupur (site coordinator and site facilitator) and Forest Department officials (Assistant Conservator of Forests, National Park Sadar Range) for their cordial support in collecting field data. I would like to give thanks Chairman, Society for Protection of Medicinal Plant and Environment (SEMP) and all respondents from the Village Community Forum (VCF) for their sincere responses during interviews.

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