Connecting Communities and Conservation:

Collaborative Management of Protected Areas in Bangladesh

Edited by

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East-West Center
and
Nishorgo Program of
Bangladesh Forest Department

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Introduction: Participation and the collaborative management of protected areas in Bangladesh

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Introduction

Collaborative management or "co-management" of natural resources involves sharing of responsibilities, benefits and decision-making powers among key stakeholders in a particular area. While the debate over community-based conservation and sustainable use of resources has continued for well over a decade, it has also become clear that fortress-style conservation has failed in many countries and that local cooperation is essential. In situations where competition over natural resources is intense and local people are directly dependent on the resource base, local stakeholders must be actively engaged in order for conservation to be effective and self-sustaining into the long-term. This means that local resource users should be empowered to take on a greater share of management responsibilities from government authorities while at the same time benefiting from improved resource management (Borrini-Feyerabend *et al.* 2000, Pimbert and Pretty 1995, Berkes *et al.* 1991).

In Bangladesh, as in other parts of South Asia, local level land-use planning and development have long been obstructed by the top-down approach favored by a traditionally centralized form of government. This in turn has negatively affected biodiversity conservation efforts and sustainable natural resource management,

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which have become critical issues in recent years throughout the country. Conservation in national parks and other protected areas has followed the conventional model of developing prescriptive management plans that focus mostly on biological aspects, and excluding local people while leaving access open only for scientific investigators and tourists. However, the demands of large populations of the rural poor and heavy illegal commercial extraction backed by local elites have proven to be impossible to manage in this way (Roy and DeCosse 2006, Sharma *et al.* in preparation). In fact, the illegal commercial extraction of resources from both terrestrial and aquatic ecosystems in Bangladesh far outweighs subsistence removal by the poor. Yet the powerful rural elites who run organized crime syndicates are rarely identified as a cause of resource loss. In this context, co-management has been proposed as a means of developing partnerships among various stakeholders to unite them in efforts to stop illegal extraction (Roy and DeCosse 2006).

Bangladesh has a high population density, and one of the world's lowest levels of protected area coverage per person. The country adopted its first co-management program for natural resources, the MACH project, in 1998. The MACH project (Management of Aquatic Ecosystems through Community Husbandry), which ends this year, was developed with the aim of addressing poverty, declining fish stocks and wetland degradation in the northeastern region of Bangladesh. MACH was also developed as a pilot study to investigate whether or not such a co-management model could effectively challenge the long-held traditional system of "command and control"-style resource management by allowing local voices to inform decisions (USAID 2004). In the evaluation process, USAID recommended that the MACH model of transparent governance should be replicated in the protected areas of Bangladesh to improve conservation management.

Thus, the success of the MACH project paved the way for developing a complementary co-management program for degraded forestlands on slopes adjacent to several of the MACH project wetlands. Because of the strong ecological impacts of forest degradation on water quality and flooding patterns, and because some of these forestlands are also protected areas of national importance, these upland sites were identified as priority sites for a pilot project in collaborative Protected Area management. Degraded national parks from the southeastern coastal zone were later selected as additional sites that, if restored, could potentially act as cyclone buffers.

In 2003, the forest co-management project, named the Nishorgo Support Project, was launched as an undertaking of the Forest Department of Bangladesh together with support from USAID. The overall goal of the Nishorgo Support Project (Nishorgo) is to enhance biodiversity conservation in the target protected areas through the active and formal involvement of local communities dependent on forest resources. This means improving the local economy and living standards of local stakeholders. Thus, a key factor is to empower the local poor to sustainably access benefits from the forest, as a way to counter the much greater threats from organized commercial timber theft, extraction for commercial brick fields or sawmills or land-grabbing (Roy and DeCosse 2006). Other specific goals include increasing the number of protected areas, improving infrastructure and capacity to receive visitors at parks, developing policies to promote better protected area management, strengthening institutional systems, and building the capacity of key stakeholders and the Forest Department. The ultimate aim is to develop a model for protected area management systems that can be replicated throughout the rest of the country.

Another objective of NSP is to strengthen the capacity of the Forest Department and local academic institutions to conduct applied research for the protected areas, in order to support the design of new and more appropriate management plans and policies. To this end, Nishorgo aims to assist researchers in addressing these priorities. In 2006 and 2007 Nishorgo and the East-West Center, with support from the Forest Department of Bangladesh and USAID, arranged a small grant and a series of workshops for Bangladeshi researchers. This enabled participants to develop study proposals and conduct field research in any of the pilot protected areas, and to write up their results.

The first round of research papers focused on issues of rural livelihoods in the pilot co-management sites (Fox *et al.* 2007), while the current (second) round analyzes the co-management initiatives implemented by Nishorgo to assess their overall effectiveness. In this second round, graduate students, university lecturers, and mid-level Forest Department site staff developed the eleven articles included in this volume. The initial research objectives included: (1) developing a definition of participation and its implementation within the Bangladesh context and putting participation into the context of power relations; (2) examining the impacts of co-management on women, the rural poor, and ethnic minorities; (3) describing the

extent to which government policies inhibit or facilitate the performance of co-management initiatives at both the micro and macro levels; (4) describing the extent to which the institutional systems and the capacity of the Forest Department affect the performance of co-management in protected areas; (5) describing the extent to which local and customary institutions and their leaders affect the performance of co-management initiatives; and lastly, (6) addressing the central question of whether or not co-management leads to conservation.

In this chapter we provide a brief review of major concepts in the literature on co-management and protected areas, with regard to three general themes addressed in the research articles: participation and governance, applications of local knowledge, and local livelihoods. An overview of each of the research articles is then provided.

Participation and governance

> *The central challenge is to find ways of putting people back into conservation. Such participation will not be easy, as the term itself is interpreted in many different ways. Only certain types of participation will lead to sustainable conservation. Alternative systems of learning and interaction will help this process of participation, and lead to a new vision for protected area management that builds strongly on vernacular conservation. The new vision will need a new professionalism, new supportive policies, and innovative inter-institutional arrangements.*
>
> - Pimbert, MP, and JM Pretty. 1995. Parks, People and Professionals: Putting 'Participation' into Protected Area Management. Discussion Paper No. 57. IIED, UN RISD, WWF: Geneva.

Participation and good governance have become central themes in conservation theory and practice, including the management of protected areas. Yet, despite their broad appeal and apparent conceptual simplicity, these ideals have proven difficult to implement in many contexts, due to socioeconomic discrimination, local power struggles, weak institutions and institutional relationships, and conflicting interests among governments, private entities and communities. The resulting lack of meaningful involvement in co-management activities and governance has served to reinforce the marginalization of specific groups, particularly the

poor, ethnic communities and women. New management models and perspectives are needed to address these constraints, through a system of truly participatory governance.

Participation is a common theme in research and programs on conservation and protected area management, and figures prominently among the papers in this volume. Public officials often see participation as a binary variable on a checklist – you either have it or you don't. In reality, however, participation is considerably more complex and elusive. Arnstein (1969) notes that participation occurs on a "ladder" with multiple possible rungs or degrees, from outright manipulation to full, unfettered involvement in decision-making. In practice, participation often falls somewhere between these two extremes, in the realm of "tokenism": the limited involvement of local actors through informing, consultation or placation. Building on Arnstein's framework, Rocha (1997) cites three basic models of participation, namely "paternalism" (highly centralized decision making with minimal citizen input); "conflict" (struggle among different interest groups to obtain influence over decisions and resources); and "co-production" (cooperative, consensus-oriented decision-making with significant public involvement).

These categories are instructive for thinking about community participation in the management and conservation of protected areas in Bangladesh and other countries where decisions about local access, rules and institutions have typically been made by higher-level government officials and passed down the bureaucratic hierarchy, with little if any input from local stakeholders. This "paternalism" has sometimes transformed into "conflict", even violence, as local actors express their dissatisfaction at being socially, culturally, politically and/or economically marginalized. In contrast, "co-production" is a relatively recent objective in natural resource management in Bangladesh that is increasing in currency under the rubric of co-management. Studies of government-community relations in protected area management elsewhere have revealed that these relations are frequently dominated by a strategy of "containment", whereby planning agencies engage in the "strategic management of public involvement... [through] conflict avoidance, exclusion of dissent, and control over knowledge and procedure" (Few 2001). Such a strategy is not conducive to meaningful participation by local stakeholders.

Many tools and mechanisms have been developed to promote greater community involvement in conservation and development programs and initiatives. They have been incorporated under the broad umbrella of Participatory Rural Appraisal (PRA), a "family" of participatory methods for ensuring bottom-up development (Chambers 1994), and have been utilized by government agencies and NGOs in a wide variety of contexts, including community based natural resource management programs and efforts to promote the collaborative management of protected areas, such as the Nishorgo Support Project.

However, these methods have also been the subject of much criticism. Some scholars claim that we should not be overly optimistic about their potential, and warn of the risks inherent in accepting participation at face value and thereby ignoring important aspects of power, interests, history, justice, legitimacy, social difference and scale (Rocheleau and Slocum 1995; Kapoor 2002). It is also important to consider the various ways in which participation can and does occur. As Lowry *et al.* (1997) suggest, participation is not just about how many people show up for a meeting or activity; it is also about specifically who shows up, and how they participate. Conversely, it is also about who does not show up and how they are excluded from purportedly participatory processes.

Baum (1999) suggests three types of participation: psychological/political, physical, and financial. Following this logic, participation in protected area management can occur in a few basic areas: (1) forest management activities (physical labor); (2) monitoring of resource use and abuse; (3) material and economic benefits (access to training, resources, and revenue from their sale); and (4) decision-making (at the community, site and higher levels). Many community members are satisfied with participation in management activities and material and economic benefits alone, until they perceive that their fundamental rights or needs are being threatened or ignored. For example, at Chunati Wildlife Sanctuary, Kabir Hossain Patwary (this volume) found that a significant number of those involved in co-management activities feel they are playing a passive role.

The direct involvement and/or effective representation of all actors in decision-making at the local (or higher) levels is imperative to secure the material and economic benefits from participation, and to influence the specific nature and rights of involvement in forest management activities. However, research on

women's participation in the co-management of protected areas reveals that they are frequently excluded from important decision-making processes and policy dialogues – due to both systemic factors and the failure of officials to implement policies on gender mainstreaming – thereby perpetuating gender inequities at multiple levels (Svarstad *et al.* 2006). Moreover, Badola and Hussain (2003) contend that women's low self-esteem, due to their entrenched sociocultural marginalization, necessitates additional incentives for their participation. Two authors in this volume, Rizwana Subhani and Shamima Begum Shewli, concur with this. They note that while some women have benefited in material, social and economic terms from their involvement in local forest user groups, women's representation and participation in local decision-making bodies remains severely restricted. Moreover, participatory conservation initiatives, such as co-management of protected areas, are viewed as compromised when local women are involved to such a limited degree (Svarstad *et al.* 2006). Therefore, there must be explicit mechanisms for women to have direct input into both local and higher-level processes and decisions.

For planners and administrators, effective participation should not be merely an item on a checklist, but a responsibility that involves better listening; more patience; more transparency about the process and expected outcomes; more attentiveness to power, how it is exercised and by whom; and more reflection on their own role in the process (Lowry *et al.* 1997). Planners should also take the time and effort to develop a deeper empathy for alternative views and experiences, and promote the active involvement of community members in facilitating roles (Umemoto 2001). Participation depends not only on the initiative of local citizens to become involved, but also on the willingness of the governing actors and institutions to let them participate, and to incorporate their views into policy decisions and management procedures. This willingness is also a key component in the concept of good governance.

According to Dearden *et al.* (2005), "governance refers to the interactions among structures, processes, and traditions that determine direction, how power is exercised, and how the views of citizens or stakeholders are incorporated into decision-making." Scholars have argued that effective governance depends on both downward and upward accountability, and a balance between local and higher-level

norms and institutions, whereby local actors have a say in decision-making, but state agencies also serve as a check on local excesses and abuses (Agrawal and Ribot 1999; Ostrom 2005). Clearly, to ensure effective co-management, there must also be mechanisms by which government officials are directly, downwardly accountable to local communities. Singleton (2000) proposes three categories of action that governments must take to facilitate successful co-management: (1) show support for the welfare of communities and the co-management processes; (2) demonstrate competence in research, oversight and enforcement related to co-management; and (3) ensure that accountability mechanisms that apply to both parties are built into the system and not dependent on individual actors. In other words, effective governance for the co-management of protected areas requires not only strong, accountable institutions at the community, site and national level, but above all strong linkages of accountability, transparency and collaboration among these various institutions (Barrett *et al.* 2001).

Co-management also means that local users and stakeholders provide input for the decisions that affect their livelihoods and access to resources. This input can take the form of participation in decision forums within their own communities, as well as representation and influence in higher-level governance bodies that incorporate multiple communities and various other local and non-local stakeholders. Accordingly, there are three basic levels of governance and participation pertaining to co-management: (1) national level governance by executive and legislative bodies (e.g., government laws and regulations, Forest Department policies and directives); (2) site-level governance and participation by multiple stakeholders (e.g., through co-management decision-making bodies); and (3) participation in community-level decision-making, forest management activities, and associated benefits (e.g., via local resource management/monitoring groups and project activities). Abdullah Abraham Hossain (this volume) finds that existing laws and policies at the national level are inconsistent with, and sometimes contradict, the co-management model being carried out by the Government of Bangladesh. He notes that this incompatibility is preventing meaningful stakeholder participation and argues that government laws and policies be revised to better reflect current co-management structures and processes. Also in this volume, Ruhul Mohaiman Chowdhury identifies three distinct groups (levels) of actors with an interest in the forest: primary stakeholders (e.g., ethnic communities living within or very close to the forest,

resource collectors, illegal loggers and timber traders); secondary stakeholders (e.g., sawmill/brickfield owners, furniture shop owners and timber concessionaires known as mahalders); and tertiary stakeholders (e.g., local government and law enforcement officials; tea estate laborers and land encroachers). He observes that not all of these stakeholders have yet been incorporated into local co-management institutions.

It is not participation and governance in and of themselves that matter, then, but rather participation in governance. In a macro-study of 41 countries, Dearden *et al.* (2005) determined that protected area governance has become more participatory over the last decade or so, leading to enhanced management effectiveness, and that these changes are increasingly supported by legislation and formal accountability mechanisms. As Brown (2002) states, "Fundamental changes are necessary to institutions and management and decision-making strategies... to effectively meet conservation and development objectives." In her study of Joint Forest Management in India, Sundar (2000) notes that the state can play a positive role in promoting more equitable and participatory forest management, by mitigating conflicts among villages over previously open-access forest lands, and articulating the needs and rights of more distant or marginalized stakeholders. In Bangladesh, while community participation in material and economic benefits, forest management activities, monitoring efforts, and local institutions regulating these aspects is critical to effective protected area management, direct involvement in higher-level institutions and policy discourses that regulate these activities is of vital importance and is still lacking. In this volume, one of the problems noted by Ruhul Mohaiman Chowdhury is that members of the primary co-management institutions are not fully accountable to their various constituents. Indeed, co-management and community-based natural resource management are still in their infancy in Bangladesh, and have yet to learn many of the lessons about participation and governance that have already been incorporated into management and policies in other countries.

Participation in monitoring and evaluation

Many authors have pointed out that conservation projects must be truly participatory in order to survive in the long-term. This is also important for the operational

aspects of protected area management. Pimbert and Pretty (1995) highlight the need to use local knowledge systems as a starting point for conservation assessment as well as the need for local participation in design, planning and evaluation of management plans. Traditional conservation models have depended heavily on the knowledge and priorities set by professionally trained biologists, foresters, and government officials, with little regard for the needs and preferences of local resource users. Assuming that rural resource users are the cause of forest degradation and that local people are not interested in conservation, protected area professionals have focused on controlling and policing the local people rather than learning from their experiences. However, the solution is not a total reversal of this situation as some have implied. While the involvement of the community is critical, in many cases both government agencies and local institutions are too weak to handle the various levels of park management independently. Berkes (2004) cautions that in shifting the balance of power from professionals to local communities, decision-making authority should be shared across stakeholder groups in order to more effectively deal with complex management issues. Monitoring and evaluation of conservation projects, then, should not only (a) incorporate local ecological knowledge and participatory data collection, but also (b) address the responses of the local resource users to the management systems themselves.

The first condition, the use of local and traditional ecological knowledge in conservation planning, has gradually gained ground as a means for both increasing the knowledge base and sharing what is known about particular ecosystems. It is also accepted as a way of increasing interactions of local communities with outside researchers and empowering them (Berkes 2004). In a review of 15 case studies across 13 countries, Danielsen *et al.* (2005) found that locally developed monitoring plans are cheaper than professional ones, and that they can prompt management decisions more quickly in response to immediate threats to the local environment. Locally generated data may help improve the understanding and attitudes of local stakeholders towards sustainable resource management, have a stronger influence on community members to take conservation action when needed, and strengthen systems of community-based resource management where they already exist. However, the review also identified a need for more reliable systems that would satisfy higher levels of park management and provide information for global databases (Danielsen *et al.* 2005).

The second condition, measuring the responses of local resource users to conservation activities, is also critical to co-management. Several case studies have used participatory research itself as an evaluation tool to assess local peoples' perceptions and understanding of the protected area systems that they inhabit. Jim and Xu (2002), working in the Shimentai Nature Reserve in China, identified inadequate communication and the lack of community involvement in the management process as barriers, leading to misinformation and unrealistic expectations of benefits on the part of the local resource users. In some cases, this confusion actually prompted villagers living in the forest to cut trees in areas where they feared they would no longer have access. Similarly in Nanda Devi Biosphere Reserve in India, Rao *et al.* (2003) found that the interactions of local villagers with park authorities were very limited, and that villagers did not have a clear understanding of park objectives. In fact, local priorities for social and economic development were frequently found to differ considerably from the options that park management had deemed appropriate. Coupled with the fact that more villagers are subjected to economic losses rather than gains by changes in the park administration, this lack of coordination has led to conflict between the two groups.

Both these aspects of monitoring and evaluation – the use of traditional ecological knowledge and local responses to co-management activities – are addressed in this volume. Working in a southern game reserve, Nayeemul Karim investigated the potential to adapt the existing system of bird counting to a community-based monitoring approach. In one of the northern national parks, Mohammad Abdul Aziz found that local villagers residing in and around the park have a much greater understanding of forest biodiversity than local people living farther away, but are far less likely to be directly involved in the co-management process.

Participation and local livelihoods

The livelihoods of many people in Bangladesh and worldwide are closely connected to forests. People rely on forests to fulfill a number of important functions. Forests safeguard environmental services that communities depend on by protecting watersheds, preventing erosion, and assuring a relatively steady source of water flow for agriculture (Balmford *et al.* 2002). Forests help many people to meet their subsistence needs with wild foods, wood to fuel fires, medicinal plants, and building

materials. Forests offer a range of economic benefits and opportunities (Godoy *et al.* 2000). Some authors have written about the role of forests as a "safety net" of sorts for when misfortune occurs, providing food and a temporary means of surviving during difficult times (Arnold 2002). Others have seen forests as a possible "pathway out of poverty" for people who harvest non-timber forest products, manage agro-forests, and/or benefit from logging and the conversion of forests to farmland (Cavendish 2003). Finally, forests (such as sacred groves) have cultural and spiritual significance and contribute to people's lives in non-monetary ways (Dudley, Higgins-Zogib, and Mansourian 2005).

Protected areas are the most commonly used mechanism for protecting forest biodiversity. However, in recent years attention has increasingly been brought to the more sinister side of protected areas, and to the ethical issues associated with the establishment of parks and reserves (West and Brockington 2006). Two of the most obvious negative impacts that protected areas can have are the displacement of people from their homes and the restriction of people's access to forest resources (Adams *et al.* 2004; Cernea and Schmidt-Soltau 2006; Brockington, Igoe, and Schmidt-Soltau 2006). But the design and management of protected areas is changing in an attempt to lessen the negative impacts parks have on local people and to improve the ability of PAs to conserve biodiversity. Protected area zonation, which allows varying levels of use in different 'zones' of a park, and co-management, which involves local people in natural resource management decisions, are two examples of how the protected area conservation model is evolving.

This volume considers the influence of protected areas in Bangladesh on local people, and looks at ways co-management strategies are being used to help mitigate the negative impacts of protected areas on communities while also improving conservation. Abu Rushed Jamil Mahmood and Mohammed Ehsanul Hoque discuss the impact of newly established co-management structures on the livelihoods of local people, while Quazi Mohammed Nurul Karim and Bikash Chandra Saha Roy write on the initiatives being employed by NSP to improve the livelihoods of people living near national parks in Bangladesh. Together, the chapters by Mahmood, Hoque, Karim and Roy draw a picture of how protected area co-management schemes in Bangladesh are being designed to address local livelihoods issues, and the initial impacts these schemes are having on local people.

Further insight into the relationship between Bangladesh's protected areas and local livelihoods can be found in the first volume of this series, Making Conservation Work: Linking Rural Livelihoods and Protected Area Management in Bangladesh (Fox *et al.* 2007).

Overview of papers in this volume

Participation and Governance

The five papers in this theme cover the full spectrum of governance and participation with respect to co-management of protected areas, ranging from national level policy issues relevant to the overall structure and implementation of co-management, to participation in everyday activities and opportunities that help conserve the forest and support people's livelihoods at the community level.

Abdullah Abraham Hossain examines the policy and legal constraints affecting co-management activities at Chunati Wildlife Sanctuary. Hossain finds that NSP initiatives to involve local people in conservation at CWS are impeded by, and sometimes contradictory to, national laws and policies. He also reports a general lack of awareness among members of the co-management councils, co-management committees, and forest user groups at CWS regarding laws and policies associated with protected area management. Hossain concludes that current policy directives contain inadequate provisions to enable co-management, and that the system is still set up in a way that precludes meaningful stakeholder participation in protected area management. He recommends that government policies be revised to enable more effective co-management structures and processes.

Ruhul Mohaiman Chowdhury assesses the functionality of the Co-management Council and Co-Management Committee at Lawachara National Park – one of Bangladesh's most touted protected areas – according to four basic principles of good governance: inclusiveness, participation, accountability and transparency. He finds that the institutional foundation for co-management at the park remains without broad-based policy support, and is driven by government and donor objectives and funding priorities. He also notes that the Council and the Committee are dominated by elite stakeholders and their interests, and that they lack basic democratic norms. He concludes that there is insufficient designation and devolution of

responsibilities and financial/administrative powers for individual Committee members; that these members are not fully accountable to their various constituents, and that under-represented groups continue to be marginalized as a result. Finally, and perhaps most importantly, he notes that there is no clear mechanism in place to replace current external project support. Chowdhury further acknowledges that, since its beginning in 2004, the Nishorgo Support Project has demonstrated that it can promote a number of promising activities and forums for the conservation of biodiversity; yet he concedes that five years is not sufficient to ensure the long-term sustainability of the Nishorgo institutional framework. He concludes that the current institutional platform – while it has not yet brought about a complete shift from a top-down conservation approach and still faces many challenges – does show promise for ensuring sustainable, participatory governance of Lawachara National Park and other protected areas, whereby local communities share fully in the responsibilities and benefits of conserving biodiversity.

In her study of "The Role of Women in Co-management at Lawachara National Park," **Shamima Begum Shewli** explores participation in three women's forest user groups. Specifically, she assesses three key issues: women's involvement and empowerment through NSP co-management activities; the impact of these activities on women's livelihoods; and women's awareness of these activities. Just over half of the women (54%) state that they participate actively in forest user group meetings, by sharing their opinions, taking on meeting responsibilities, and raising questions. However, most women face constraints in attending meetings regularly, due mostly to household and family obligations. Women are also poorly represented in higher-level co-management institutions. In fact, none of those interviewed during the study belong to the Co-management Council or Committee. Results also show that nearly half of the women earn income independently. Of these, about 81% are engaged in Nishorgo activities. The top two reasons reported for joining a FUG are to "save money" and "preserve biodiversity". However, awareness about co-management activities is quite low. Less than half of the respondents know that NSP promotes forest protection, and only about one third are aware of specific training programs or meetings organized by NSP. Despite this low awareness, many women report that they motivate their neighbors and/or husbands to conserve the forest. Based on these results, Shewli concludes that increased involvement of women in a fuller range of co-management activities and forums will both

enhance the socioeconomic well-being of their households, and aid in the preservation of the valuable biodiversity on which this well-being ultimately depends.

Rizwana Subhani evaluates the influence of participation in forest user groups at Satchari National Park on women's access to income-generating activities, their degree of socioeconomic empowerment, and the physical and material well-being of their households. She finds that membership in women's user groups has risen over the past year, and that about two thirds of women non-members show an interest in joining a group. Her findings also reveal that nearly three out of five FUG members have received training and funding for alternative income generating activities, and that 41% of those trained have successfully developed their own enterprises, compared with 7% of non-members, who have received no training. Perhaps due to their involvement in these activities, most of the FUG members' report that their households are no longer involved in the fuelwood trade. In addition to advancing their material well-being and reducing their reliance on forests, results indicate that some women feel their participation in forest user groups helps increase their skills, their decision-making power and their respect in the eyes of family members and society. These results suggest that participation in co-management activities and institutions, through membership in user groups, can enhance women's economic and social status, as well as their livelihoods.

Kabir Hossain Patwary explores the degree and quality of participation by local people in the co-management of Chunati Wildlife Sanctuary. His research looks at how communities in close proximity to the sanctuary are involved in the planning, management and evaluation of co-management activities. Drawing on Arnstein's "ladder of participation" (1969), Patwary discusses how participation can take many forms and occur at varying degrees. He uses Deshler and Sock's framework (1985) to study how local people involved in co-management activities perceive their own degree of participation in protected area planning, management, benefit-sharing and project evaluation. His findings show that interviewees feel they are most involved in the implementation of co-management activities and the sharing of benefits, and considerably less involved in protected area planning and project evaluation. Patwary also investigates people's knowledge of co-management activities at CWS and finds that although most people are familiar with the general purpose of co-management, only a few can give specific objectives. Patwary's study

brings to our attention the ambiguity of the term "participation", and the importance of involving people in more truly collaborative management.

Participation in Monitoring and Evaluation

Nayeemul Karim examines the existing system of bird monitoring in Teknaf Game Reserve to evaluate its suitability for a community-based monitoring approach. The objective of the study is to assess the level of local peoples' knowledge with regard to eight indicator bird species chosen for avian monitoring. These species were preselected by a team of biologists without any direct meetings with local stakeholders, but with the intention of including recognizable species where possible. Almost all birds were well-known, especially those which are valuable as food, pets, trophies, or for pest control. Karim's study finds that respondents' level of knowledge of the species increases steadily with the proximity of their settlements to the forest." Although age and gender have no relationship with the level of a person's knowledge, factors corresponding to the distance of people's homes to the forest (i.e., ethnic community and religion) are clearly linked to their level of local knowledge. Only villagers living within the forest are familiar with all of the selected species, and so a community-based monitoring system using all eight species inside the forest would be most effective if restricted to participants from only that group. However, communities living in the edge areas of the park are able to identify most species, so they would also be able to participate in bird surveys for the species known to them. Thus, the value of the indicator species used for community-based monitoring programs depends on the groups who are to carry out the surveys.

Similarly, **Abdul Aziz** finds that local villagers residing in and around Lawachara National Park have a much greater understanding of forest biodiversity than local people living further away. Although similar proportions from each group understand the importance of trees and forests, villagers are more likely than townspeople to correctly identify major forest vertebrates from photographs. Villagers are also about twice as likely as the local town elites to have had firsthand observations of the animals used in the survey and to understand their ecology. However, these villagers are poorly represented in the co-management apparatus, and have little knowledge of the park's objectives. More than half of the villages are not represented at either the co-management council or committee level, whereas two zones represented in these administrative bodies (Srimongal and Komolgonj) are not even located in the immediate park vicinity. Conversely, members of the local elite and

local government are heavily involved in the administrative bodies for co-management compared to the villagers, and have a clearer idea of the park's goals; but they have little knowledge about the species and ecological significance of the park itself. These individuals sometimes take over the co-management meetings to further their own personal agendas. This detracts from attending to important administrative concerns of the park that affect rural people, such as habitat restoration, wildlife management, and forest protection. In fact, in cases where the elite are involved in forest poaching, local villagers who witness the crimes have no means to report the offenders. This major division of power in the management of the park is yet to be addressed.

Participation and Livelihoods

Quazi Mohammed Nurul Karim examines NSP's support for alternative income generating activities (AIGAs) to reduce local people's dependency on forest resources inside Teknaf Game Reserve. These activities include poultry rearing, vegetable gardening, pisciculture, investment in family businesses, establishment of tree nurseries, installation of improved cooking stoves, and cattle rearing. Nurul Karim's findings reveal mixed results. One of the poultry varieties provided by NSP is so highly susceptible to disease that many of the recipients of these birds have lost not only the donated chickens but also their own older stocks. Some of the pisciculture AIGAs have not fared well either, because participants are not trained in proper pond preparation and fish introduction techniques. On the other hand, AIGA support for small-scale trade, tree nursery development, and chulla making has done reasonably well. One of the greatest challenges of the program is that so many people depend on the reserve for their livelihood needs, yet AIGA opportunities are insufficient and are only offered to members of the co-management committees and councils, community patrolling groups, and forest user groups. Nurul Karim's research also reveals inequities in the distribution of AIGA opportunities, with some households receiving training and supplies for two activities, while others receive none. Finally, the economic value of AIGA remains limited, bringing into question whether they can significantly reduce recipients' dependence on the forest or bolster their livelihoods. Based on these findings, Nurul Karim calls for better coordination between the Forest Department, NSP and intended beneficiaries; and more consistent monitoring to ensure that AIGA support is equitably and effectively distributed.

Protected areas in Bangladesh and elsewhere are used by local people who collect fallen limbs and twigs for fuelwood, and also cut immature trees. The unsustainable harvesting of fuelwood from PAs leads to environmental degradation, but curbing the collection of fuelwood creates an ethical dilemma because many local people depend on fuelwood to meet their energy needs, the most important of which is cooking. NSP, German Technological Cooperation (GTZ) and Grameen Shakti (a Bangladeshi NGO) have introduced more energy efficient cooking stoves (chullas) to local people surrounding Chunati Wildlife Sanctuary as a means of addressing the problem of forest degradation from excessive fuelwood harvesting. In his paper, **Bikash Chandra Saha Roy** discusses the impact that the improved chulla program at Chunati Wildlife Sanctuary has had on reducing local people's dependency on the sanctuary for fuelwood. His findings suggest that users of improved chullas collect smaller amounts of fuelwood, and less often, from the sanctuary. They are also considerably less likely to illegally sell fuelwood than users of traditional chullas. Roy also highlights inequities in the availability of improved chullas, especially among the poor, and recommends that measures be taken to make them more easily available and affordable to all people living near CWS and other PAs in Bangladesh.

Mohammed Ehsanul Hoque evaluates the impact of people's involvement in forest user groups (FUGs) on the reduction of poverty and inequality in Chunati Wildlife Sanctuary. Stratifying his respondents according to wealth, he uses a few basic measures (i.e., number of meals per day, social status within the community, perceived benefits of membership) to compare the general level of poverty. Adopting the Sustainable Livelihoods Approach (Ashley and Carney 1999) he assesses differences in "ownership of and access to resources" (i.e., human, natural, financial, physical and social capital) between the two groups. Using these measures, he finds that poverty is lower among FUG members, and that resources are distributed more equally among FUG members than among non-members. Moreover, the study reveals that FUG members are more conscious of health-related issues, more likely to have access to safe drinking water, less likely to become ill, more financially secure, more equal in their land accessibility, more socially empowered, more apt to interact with other members of their community, and more likely to receive support from other community members in times of need. These findings imply that the overall situation of poverty and inequality among FUG members has been

enhanced, especially compared with non-members. Suggesting that these findings appear to validate the co-management model, Hoque recommends the expansion of research on this topic to cover a broader community and more protected area sites.

Abu Rushed Jamil Mahmood adopts a methodology developed by Colfer *et al.* (1999) to examine the perceptions of key primary stakeholder groups of Chunati Wildlife Sanctuary (forest villagers, betel-leaf cultivators, and fuelwood/bamboo/sungrass collectors) about the impacts of co-management on three major elements of their well-being: intergenerational access to resources; means and rights to manage forests; and the health of forests, forest actors and their cultures. His findings reveal that, although stakeholders have clearly acknowledged rights to manage the forest, they feel that access is inequitable and not adequately secured for future generations. For example, in most cases (except for bamboo collectors), primary users feel that the Forest Department and local traders accrue a greater share of resources than they do. Overall, respondents view the Forest Department as holding nearly half (45%) of the rights and means to manage resources in Chunati, with the remainder divided among Nishorgo officials (23%) the Co-management Council and Committee (12%), forest patrolling groups (10%), forest user groups (7%), and other stakeholders (3%). Thus, primary resource users feel they have very limited rights or influence in the management of the sanctuary. Moreover, they predict that the availability of all major livelihood resources derived from the forest will decline substantially over the next ten years. Many also sense a lack of balance between human activities and environmental conditions in the forest, noting that illegal activities continue to degrade the forest, threatening the health and culture of local populations. Overall, despite some perceived progress, Mahmood concludes that human well-being remains severely compromised at Chunati Wildlife Sanctuary and that Nishorgo's conservation efforts will only succeed when local people benefit fully from co-management decisions and activities.

Conclusions

The eleven papers in this volume illustrate that the co-management of natural resources and protected areas occurs on multiple levels. The authors show that although community-based natural resource management is still in its infancy in Bangladesh, measurable improvement has been made in terms of poverty reduction,

gender equity, resource dependence, and income-earning opportunities. However, co-management is not only about allowing local citizens to participate in forest management activities and share in the benefits that these activities produce; local users and stakeholders must also have the ability to influence the decisions that affect their livelihoods and their access to resources. It is in this area of participation that many issues remain to be addressed. Lack of local stakeholder input afflicts not only the governance machinery in place for co-management (i.e., the structure of the councils, committees, and forest user groups), but also the biological and social monitoring process, and the means by which PA benefits are distributed and selected. Moreover, power differentials continue to determine whose voices are heard in each of these matters, which in turn affects the flow of valuable information from those most closely in contact with the resource base. This leads to weakened protected area management that serves the needs of local elites, academics, and forest administration to the exclusion of local villagers, women, ethnic minorities, and the poor.

This situation is particularly precarious in Bangladesh, where deforestation since the 1970s has been driven largely by the patronage of the elite. By utilizing their social and political networks, hiring the local poor to carry out illegal felling and encroachment operations, and influencing the authorities to secure contracts and resolve legal charges in their favor, local businessmen have exploited public forests for private commercial gain without hindrance. Rampant corruption has reinforced this system over time, and there is a danger that even under co-management, the most powerful stakeholders will usurp the process. To paraphrase Wyckoff-Baird *et al.* (2000), participatory management runs the risk that in widening the group of actors making decisions, those with the most money and expertise will unite and control the management process. This is especially true in a country where democratic processes are still nascent and good governance is yet to be established in the wider public realm.

Several of the studies in this volume indicate that this may already be happening. For instance, current co-management institutions (i.e., the Co-management Councils and Committees), as well as existing laws and policies, still reflect the top-down approach of the previous management structure (Hossain, this volume). Furthermore, co-management institutions are dominated by elites, are not fully accountable to their constituents, and lack clear guidelines on the devolution of authority

and responsibilities to their various members (Choudhury, this volume). In addition, direct involvement of forest-dependent stakeholders, especially women, in co-management activities, institutions and decision-making forums that can enhance their socioeconomic well-being and their contribution to forest conservation remains very limited (Aziz, Shewli and Subhani, this volume). Finally, many primary stakeholders perceive themselves as playing a limited or passive role in PA management and decision-making (Patwary, this volume), and as having a low level of awareness about Nishorgo activities (Shewli, this volume), while their participation in alternative income generating activities is viewed as both insufficient and inequitable (Nurul Karim and Shewli, this volume).

Government conservation agencies such as the Forest Department have an obligation to address these issues by recognizing that effective participation can enhance forest management and protection, and also promote socioeconomic benefits and greater human and gender equity. Local people who are most directly invested in the parks' well-being must be empowered to participate meaningfully in conservation. The advancement of conservation and livelihood goals will ultimately depend on the ability of government agencies to support the aspirations and management practices of local user groups, both financially and technically. What is perhaps most important is the relative power of local resource users and institutions vis-à-vis village-level leadership, parallel institutions, external private actors, and local administrative and governing bodies. In other words, accountability in governance depends on the right and the ability to challenge local actions and decisions and higher-level decisions concerning how, and by whom, local resources are managed and utilized. Forest authorities are critically positioned to mediate such power relations. However, effective participatory governance also requires the ability of governments to 'let go', or to stop interfering in local-level decisions about the management of protected areas, by granting local governing institutions greater autonomy, while ensuring their accountability to local constituents by insisting on democratic structures and processes.

Although co-management does not necessarily eliminate conflicts between government actors and communities, or ensure that resources are managed sustainably, it does open up new possibilities for constructive engagement between the state and communities. The role of the state in successful co-management efforts far exceeds "'getting the institutions right' or acting merely as a third-party enforcer of rules"

(Singleton 2000). Through the concerted efforts of local actors and conscientious officials, ongoing support from the Forest Department, innovative projects like Nishorgo, and practical insights from researchers, such as those contained in this volume, co-management has the potential to bring lasting benefits to communities living in and around the protected areas of Bangladesh, while preserving precious biodiversity for the use and appreciation of generations to come.

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Constraints in Policy and Legislation with Respect to the Performance of Co-management Initiatives at Chunati Wildlife Sanctuary

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Abstract

Like many other countries, Bangladesh has established a network of protected areas (PAs) over the past several decades. The Bangladesh Wildlife (Preservation) Act was promulgated in 1973 and amended in 1974 for the protection and conservation of wildlife. Based on this law, the Forest Department adopted a PA system by selecting representative areas from Reserved Forests. Chunati Wildlife Sanctuary is one of these PAs, yet it contains interspersed settlements, cultivated lands, and paddy fields supporting the livelihoods of a large number of rural poor. To cope with these circumstances, the Forest Department introduced a co-management approach in Chunati along with four other PAs. This approach has included the implementation of development projects, but has not addressed the legal provisions and policy directives that block truly participatory co-management of the sanctuary. This study assesses constraints in policy and legislation with respect to the performance of PA co-management. This research involved adopting criteria and indicators, interviewing members of the co-management council and committee, and identifying aspirations of the forest user groups and community patrolling group. This study has revealed that existing National Forest Policy directives and legal frameworks are constrained in achieving the objectives of co-management in PAs by the absence of provisions enabling co-management in the policy directives and by existing measures that exclude stakeholder participation in PA management.

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Introduction

Two World Park Congresses and the International Union for the Conservation of Nature (IUCN) have advocated co-management of protected areas as fundamental to the sustainable administration of these areas (IUCN 2003). Co-management means: "the sharing of power and responsibility for resource management between the government and local resource users" (Singh and Vangile 1995). The rationale for co-management is to develop community-based approaches and institutional capabilities for wise management, sustainable productivity, and biodiversity conservation in protected areas (PAs). Under this scheme management authority, responsibility and accountability are shared among two or more stakeholders, including government bodies and agencies (at various levels), indigenous and local communities, non-governmental organizations, and private parties (IUCN 2003). Many countries have adopted co-management to empower local people to make decisions about the management of protected areas and share in the benefits derived from these resources (Svarstad *et al.* 2006).

The British initiated formal forest management in the Indian subcontinent, including Bangladesh, in 1862 (Choudhury 2002) and brought forest management under a legal framework by promulgating the Forest Act of 1865. It was reformatted according to other commonwealth countries in 1878. The government enacted an official forest policy in 1894 – probably the oldest policy document on Bangladesh's forests – that subsequently underwent revisions in 1955, 1979 and 1994 and is still used by the government (Chowdhury 2003). In order to implement specific forest policy directives, the government put into effect the more comprehensive Forest Act of 1927 by amending the Forest Act 1865 and its subsequent revision of 1878 (Sharma *et al.* undated). Responsibility for the implementation of the national forest policy and legal provisions lies with the Forest Department (FD). After this comprehensive amendment of forestry law, the FD brought a number of forest lands under the status of reserved forest. To manage these forests, the FD prepared a number of different regulations and management plans that excluded local participation in forest management. Since 1928 the FD has amended the Forest Act fourteen times. In 2000 the Forest Act was amended to accommodate participatory social forestry.

With growing concern for wildlife protection and biodiversity conservation in Bangladesh, the FD adopted a PA management system in reserve forests after enacting the Bangladesh Wildlife (Preservation) (Amendment) Act 1974 (GoB 1974). When managing these PAs, the FD treats local people as an element of the management problem. Although the concept of a "protected area" is not defined by law, there are three categories of de facto PAs inherent in the law: (1) national parks, (2) wildlife sanctuaries, and (3) game reserves. Except the PAs of the Sundarbans, most of the PAs are characterized by interspersed settlements of local communities, cultivated land, and paddy fields supporting the livelihoods of a large number of rural poor. Under these circumstances, the FD determined it was essential to introduce co-management in the PAs. Consequently, in 2004 the FD initiated the Nishorgo Support Project (NSP), under the advice and guidance of the United States Agency for International Development (USAID), to facilitate co-management in five PAs, including Chunati Wildlife Sanctuary (CWS).

The National Forest Policy 1994 and the Forestry Sector Master Plan (1995-2015) highlight the importance the government places on participatory forest management. The FD developed these documents in order to promote the expansion of PAs, the development of forest-based rural industries, the protection of biodiversity in degraded natural forests, the expansion of wildlife habitat, and the empowerment of people to participate in forestry activities. While meeting these objectives has been declared to be forest policy, it is still difficult to support co-management initiatives under these same policy directives. The forestry sector's master plan calls for "people-oriented programs" with PA expansion and community-based resource management. But, legal recognition of peoples' participation in PA management has not yet been incorporated into national legislation. As a result of the lack of official recognition of the role of local people in PA management, policy makers and stakeholders are constrained from implementing effective co-management in CWS. In order to assess the policy and legal constraints affecting co-management activities in Chunati Wildlife Sanctuary, I adopted related co-management criteria recommended by the International Tropical Timber Organization (ITTO 1998). These criteria are: (1) enabling conditions for sustainable co-management of the PA, (2) ecosystem health and biodiversity of the PA, and (3) economic, social and cultural aspects of communities relying on the PA. The specific questions I seek to answer include the following:

1. How do the policies and legislation reflect the objectives of co-management as seen by the criteria fixed for this study?
2. How do the members of Co-management Councils and Co-management Committees see constraints in policy and legislative documents?
3. What are the aspirations of forest user groups and community patrolling groups for co-management and how are these aspirations constrained by policy and legislation?

Background

Located in the southeastern region of Chittagong, Chunati Wildlife Sanctuary is comprised of seven forest blocks. The area used to be rich in biodiversity and had a dense forest of garjan (*Dipterocarp spp.*) and other hardwood species, which provided a good habitat for wildlife including the Asian elephant (*Elephas maximus*). The FD first introduced forest management in 1923 with a 20-year work plan. Under the Forest Act 1927, the FD declared the area a forest reserve. In 1986 Chunati Wildlife Sanctuary was created. The sanctuary covers 7,764 ha of forestland under the Bangladesh Wildlife (Preservation) (Amendment) Act 1974. FD personnel prepared working plans for the forest until 2000, with various prescriptions. These plans were strictly followed except for the period from 1942 to 1945, during World War II, when the forest was seriously depleted. Under these management plans, the main activity of the FD was tree felling followed by artificial regeneration to improve timber and fuelwood production, primarily in order to increase revenue for the government. Although the FD may have considered the impacts of the forest management plans on local people, they did not include locals in the designing of these plans.

The FD began focusing on the conservation value of Chunati forest after declaring the area a wildlife sanctuary in 1986. The department created "Preservation Working Circles" (a land-use designation) to introduce wildlife management practices in the management plan prepared for the ten-year period from 1991 to 2001. As a result of these prescriptions, commercial tree felling stopped, visitor facilities like a rest house and wildlife watchtower were constructed, a small fodder tree plantation was established, and large plantations of long and short rotation timber trees were established under donor financed projects on an ad hoc basis. In 2001 the FD

prepared a two-year summary action plan for the sanctuary as part of the conservation area management component of the forestry sector project.

Official documents reveal that forest management adopted distinct courses of action to achieve the desired objectives of the government. The British developed a national forest policy in 1894, which was subsequently revised in 1979 and 1994. Both the development and revision of the national forest policy has been top-down. Necessary policy instruments – including regulatory, judicial, institutional, economic, programmatic, capacity-building, and evaluation tools – have been established to steer development towards goals set in these policies. Thus, forest administration in Bangladesh was built on a linear model of the policy development process, starting with policy formulation and ending in policy implementation. However, monitoring and evaluation processes have often not been implemented due to insufficient information, frustration among actors, paucity of funding, and poor socio-economic conditions.

Durst (2002) suggests that as a general rule any policy developed in a top-down and elitist manner will be less effective than a policy that has been formulated through participation of interested and affected parties. Due to the lack of community participation in forest management and protection, as well as overexploitation from commercial logging by the FD and illegal logging for commercial uses, Chunati's forest has been severely degraded. Illegal encroachment for agriculture, settlements, brickfields, betel leaf cultivation and illicit felling have resulted in the sanctuary containing interspersed human habitations and cultivated land. There are now seventy settlements within the sanctuary and fifteen villages near the boundaries. Mollah *et al.* (2004) identified twenty-four stakeholder groups, nineteen of which are considered primary stakeholders, living in or near the sanctuary and dependent on its natural resources.

Seeking to assist the government of Bangladesh to improve its management of tropical forest resources, USAID funded NSP as part of its effort to reduce poverty through sustainable economic growth (FD 2005). NSP works in five PAs, including Chunati Wildlife Sanctuary. NSP seeks to achieve the following goals: develop a co-management model, identify income generation activities for key stakeholders, prepare appropriate policies and constituencies, strengthen the institutional

systems and capacity of the FD and key stakeholders, develop infrastructure, and restore habitats in the pilot PAs.

Methods

I collected both primary and secondary data while conducting this research. In order to understand the policies and laws that constrain co-management I analyzed only major national policies and juridical instruments, such as the Forestry Sector Master Plan, National Forest Policy 1994, Forest (Amendment) Act 2000, Bangladesh Wildlife (Preservation) (Amendment) Act 1974, and related bylaws and management tools developed under NSP. These policy instruments are used to steer development towards the goals set by national policies. There are other policy instruments that are also important. For better understanding I made a short listing of these policy instruments and grouped them according to the concepts of Nilsson (2003), as shown in Table 1.

Category of policy instruments	Examples of policy instruments (Nilsson 2003)	Policy instruments in Bangladesh for PA management
Regulatory/ judicial	Constitutional guarantees, laws, bylaws and other regulations, rights, tenure, trade, legally binding international connections	The Constitution of Bangladesh; Forestry Sector Master Plan; Poverty Reduction Strategy Paper; National Forest Policy 1994; Forest (Amendment) Act 2000; the Bangladesh Wildlife (Preservation) (Amendment) Act 1974; Social Forestry Rule 2004; Bangladesh Crab Export Policy 1998; Saw Mill (Licensing) Rule 1998; Brick Burning (Control) (Amendment) Act 1992; Brick Burning (Licensing) Rule 1989; the Chittagong, Cox's Bazaar and Comilla Forest Transit Rules 1959; General Forest Transit Rules 1960; East Bengal State Acquisition and Tenancy Act 1950; Land Reforms Act 1984, Limitation Act 1887; Cattle Trespass Act 1871; government orders on Co-management Council and Co-management Committee formation; forest user group guidelines, meeting resolutions, and agreements. Additional laws are used for forest offences and implementation of the forest and wildlife acts: Penal Code 1860, Evidence Act 1871, Criminal Procedure Code 1898,

Category of policy instruments	Examples of policy instruments (Nilsson 2003)	Policy instruments in Bangladesh for PA management
		Civil Procedure Code 1908, Social Welfare Act 1961, and Foreign Donation (voluntary activities) Regulation Act 1978 to guide and control NGOs
Economic/ market	Taxes and revenue systems, subsidies, stumpage,permits, auctions, certification	Taxes and revenue systems, permits, auctions, Public Procurement Rule 2003, Compounding Offence Report, fees
Information	Extending science, education and training, research, monitoring and information systems, policies in other sectors	Education and research (university level), in-service training at college level and at school level, Bangladesh Forest Research Institute, training abroad, policies in other sectors (National Environment Policy, National Agriculture Policy, National Water Policy, National Industrial Policy, National Land Use Policy, Integrated Coastal Zone Policy), RIM-GIS Unit of FD, Bangladesh Bureau of Statistics, FAO and UNDP
Institutional	Property regimes, concession systems, partnership/ dialogue mechanisms, mitigation of corruption and capital flight	Forest Department, NGOs, Co-management Council, Co-management Committee, forest user groups, community patrolling groups, and sawmill owners associations
Agreements	Management agreements, non-legally-binding international agreements	Participatory Benefit Sharing Agreement, Landscape Development Fund, Strategic Objective Grant Agreement, memorandum of understanding, etc.
Adaptation and evaluation	Manuals and plans	Forest manual; Management Plan of Chunati Wildlife Sanctuary 2006; Implementation, Monitoring and Evaluation Division Report; monitoring tools developed under NSP (bird counting for monitoring, photo monitoring, etc.)
Sustainable development frameworks	Overall coordination	Project steering committee, Bangladesh Wildlife Advisory Board
Forest sector programs/ strategies	National forest programs	Poverty reduction strategy paper, forestry sector master plan
Implementation Strategy Choice	Annual development program	Medium-term budgetary framework, annual development program
Implementation of Policy Frameworks	Development projects	The NSP Development Project Proforma, technical assistance projects, investment projects

I excluded the rest of the policy instruments due to time constraints. In order to assess the policy and legal constraints affecting co-management activities in Chunati Wildlife Sanctuary, I adopted criteria from those recommended by ITTO (1998). These criteria were: (1) enabling conditions for sustainable co-management of the PA, (2) ecosystem health and biodiversity of the PA, and (3) economic, social and cultural aspects of communities relying on the PA.

When analyzing policy and legal constraints of the co-management activities at Chunati, I looked at the larger policy process. I visited all concerned offices to collect necessary literature, articles and books. Some important articles were also collected through internet research. In order to understand how people who participate in NSP activities perceive the policies and laws under which co-management works, I visited Chunati Wildlife Sanctuary on several occasions between April and June 2007. During these visits I conducted interviews with members of a co-management council and a co-management committee. I randomly selected ten members from the co-management council and ten members from the co-management committee to interview using a semi-structured questionnaire that utilized blueprint and learning process approaches (Pimbert and Pretty 1995). I assessed members' understanding of policy instruments while conducting the interviews. I made an effort to clarify the terms used in the questionnaire while conducting the interviews. Finally, I participated in the 7th Co-management Council meeting held on April 21, 2007 at Chunati Union Parishad, Chunati and interacted with the council members there.

I developed an open-ended questionnaire in both English and Bengali to conduct interviews with members of the forest user groups (FUGs) and community patrolling groups (CPGs). In these interviews I sought to learn about local livelihood strategies, needs, and aspirations. I made a concerted effort to identify policies and legal documents that constrain co-management. After receiving feedback from CPG members, I translated the questionnaire from English into Bengali to conduct interviews with FUG members. I collected basic household information and data on major variables found on Messer and Townsley's (2003) checklist. This included data on human capital, natural capital, physical capital, financial capital, social capital, vulnerability context, seasonal patterns of occupation, and local institutions of the FUGs and CPGs. I interviewed six FUG members and ten CPG members.

Results

I analyzed constraints on co-management posed by existing policy, legislation, bylaws and management tools on the basis of the three criteria mentioned above. A fuller description and analysis of related constraints for each of the criteria is provided below.

Criterion 1: Enabling conditions

This criterion covers the general institutional requirements for implementation of sustainable co-management in PAs. Indicators like *policy and legal framework, economic framework* and *institutional framework* are used to assess constraints in implementing co-management in Chunati Wildlife Sanctuary.

Policy and legal framework. Appropriate policies and legal frameworks ensure the successful functionality of an institution and thus help achieve desired objectives. Successful policy formulation should be followed by a cycle of implementation, monitoring, and evaluation – the last of which the FD's projects generally lack. The FD prepared the Forestry Sector Master Plan (1995-2015) as a long-term strategy for forestry development in the country and revised forest policies accordingly to accommodate recommendations of the master plan. The department also prepared a five-year action plan to start implementation of the master plan. However, the department did not prepare subsequent action plans after completion of the first five-year action plan and today it is difficult to evaluate the implementation of the master plan. Because the FD failed to create subsequent action plans, development projects with durations ranging from three to five years were prepared on an ad hoc basis.

According to official records of the FD, consultants were hired to work under top-down management to prepare the master plan, national policy, and action plan. Stakeholders' participation in the preparation of these documents was minimal. Themes of the International Convention, Treaties and Protocols (ICTP) were included into the policy directives but there was a failure to incorporate local needs and aspirations in policy documents. This has resulted in negative attitudes, resentment towards PA management, and conflicts between FD staff members and local stakeholders.

The Bangladesh Wildlife (Preservation) (Amendment) Act 1974 is the special law on PA management in Bangladesh and this law prohibits almost any type of human activity within a PA. The law has never been amended to create legal room for PA co-management activities. Some of the required bylaws and management tools have been prepared for the implementation of co-management in Chunati Wildlife Sanctuary, but many of them are still at drafting stage and under consideration for approval by appropriate authorities. Necessary amendments to the wildlife act have not yet been passed to accommodate provisions for co-management in PAs. Table 2 below shows the status of all these bylaws and management tools.

Table 2: Approval status and formulation processes of bylaws and management tools prepared for the implementation of co-management in Chunati Wildlife Sanctuary

By-laws and management tools	Approval status and legal compliance	Formulation process
Development Project Proforma of Nishorgo Support Project	Approved by the Executive Committee of the National Economic Council and again revised in 2005	Jointly formed by FD and USAID. Local stakeholder participation was absent.
Management plan of Chunati Wildlife Sanctuary 2006	Approved by the government vide memo no. Pabama/Parisha-4/119/Mane:Plan/Nishorgo/2006/296 Dated: January 16, 2007	Effort has been made to consult local stakeholders
Guidelines for the council formation of forest user groups	Draft guideline was prepared mainly by CODEC[1] and submitted through NSP to FD for necessary approval.	CODEC has prepared this document through consultation with stakeholders
Constitution of Co-management Council of national park/sanctuary/game reserve	Not approved	Draft constitution has been prepared by International Resources Group[2] and not yet finalized
Community Patrolling Guideline	Not approved	Draft guideline has been prepared by IRG
Agreement for community patrolling implementation	Not approved	Draft guideline has been prepared by IRG

By-laws and management tools	Approval status and legal compliance	Formulation process
Guidelines for tourist information centers operation (in Bengali and English)	Not approved	Draft constitution has been prepared by IRG but not yet finalized
Operational guidelines for Nishorgo club	Not approved	Draft constitution has been prepared by CODEC but not yet finalized
Elephant ride as an enterprise – issues to be addressed	Not approved	Draft constitution has been prepared by IRG but not yet finalized
Final infrastructure design concept for eco-lodge around Nishorgo protected areas	Not approved	Draft guideline has been prepared by IRG
Government order on the formation of Co-management Council and Committee	Issued by Ministry of Environment and Forest but not yet incorporated into law	Government order
Meeting resolutions of the Co-management Council and Co-management Committee	Not yet brought under the monitoring and evaluation mechanism	Prepared by the members of the Co-management Council and Co-management Committee

[1] The Community Development Center (CODEC) is a Bangladeshi NGO working in CWS to implement NSP activities.

[2] The International Resources Group (IRG) is a U.S. consulting firm responsible for overall implementation of NSP.

The Ministry of Environment and Forest issued a government order by gazette notification vide memo no. Pabama/parisha-4/Nishorgo-64/(Angsha-4)/112, dated May 15, 2006 (Islam 2006), regarding the formation of eight co-management councils and co-management committees, including their terms of reference for five PAs brought under NSP. The structural formation and functioning of the co-management councils and co-management committees are probably the most visible institution for ensuring local participation in PA management. These are newly developed institutional policy instruments that, according to the government order, allow the formation of these local institutions in compliance with the project proposal of NSP but not in pursuance of any existing law. Therefore, the legal basis of these institutions is still under question.

Each co-management council consists of fifty-five members drawn from different sections of society – from elected parliament members and government officials to

local inhabitants in and around the PAs. Co-management councils each have five distinct categories of members: civil society, local administration, local representatives, local NGOs and other government agencies. Similarly, each co-management committee has fifteen to nineteen members with ten distinct categories of members elected from the respective member categories of the co-management council. In the co-management councils, it is required that women make up at least 18-percent of the members and 7-percent of the co-management committee. The structural entity of the councils and committees appears to be effective while the functional entity is still not clear. NSP has recommended that a full-time accountant/administrative officer be appointed by each co-management committee. NSP will provide salary support for one year, but after that it is not clear who will support this position.

Economic framework. USAID seeks to assist in the development and success of co-management at CWS and the other PAs through its investments in NSP. These investments are limited to the project period. After this period it is uncertain where the flow of financing for co-management will come from. NSP has proposed a landscape development fund to provide long-term community support but the government has not yet approved this. The FD is currently processing a proposal to the government from NSP to provide a small amount of funding (TK 0.23 million) for 10 km of roadside plantations and another project (TK 0.356 million) for road construction. The government's slow approval process and ad hoc investments are causing a bottleneck in the development of a self-sustained benefit sharing mechanism.

Institutional framework. Currently two distinct categories of institutions exist for managing PAs. One is the Forest Department approach, which may be described by its visibility, exclusiveness and practicality. The other is the locally operated co-management councils, co-management committees, FUGs and CPGs' approach which may be described as normative, inclusive and to some extent invisible. All of the policy instruments required to run the FD are built on a strong legal framework. But the policy instruments that are required to run the co-management approach do not yet exist. Thus far the government has only developed bylaws – such as government orders, guidelines, agreements, and some management tools – to make co-management functional through forming local institutions. The institutions in

place for co-management have a lack of experience as well as insufficient capacity and poor mechanisms for planning, decision-making, data collection, monitoring, assessment, and timely sharing of information. In absence of clear policy instruments, the functional ability of these institutions will be further constrained. NSP recommends that membership roles, responsibility and mechanisms of benefit sharing be documented, but this has not yet been implemented. This situation is constraining co-management implementation.

Criterion 2: Ecosystem health and biodiversity of PA

NSP seeks to manage and restore wildlife habitats in CWS through participation of local stakeholders. The Bangladesh Wildlife (Preservation) (Amendment) Act 1974, however, does not allow local stakeholders to participate in developing and implementing programs to restore habitat or do enrichment plantings in identified gaps of the sanctuary. The policy directives of the National Forest Policy 1994 sought to address biodiversity conservation, but these directives currently only address issues on degraded forest lands and not PAs. According to policy directives, the responsibility of biodiversity conservation lies solely with the FD. Criterion 3: Economic, Social and Cultural Aspects

To address Criterion 3, I have assessed CWS's socio-economic and cultural aspects and the quality of community participation in park management to determine the policy and legal constraints to achieving the objectives of NSP.

Socioeconomic aspects. According to the *Statistical Book* (1991), the total population of Chunati Wildlife Sanctuary is 21,428, of whom fifty-two percent are men and forty-eight percent are women. These people are directly or indirectly dependent on Chunati Wildlife Sanctuary. There are about seventy settlements (*para*) in and around the sanctuary. The FD assessed forty-two of these settlements from Chunati Range during preparation of the management plan. Of these settlements, twenty-four are located within the sanctuary, thirteen are located near the boarder, and five are located within five kilometers of the sanctuary. One-third of local inhabitants are unemployed, which results in increased pressure on the forest (FD 2006). NSP currently seeks to implement a number of activities such as identifying and initiating enterprise/business development opportunities and production technologies,

setting up a landscape development fund, organizing micro-credit facilities, and providing training and infrastructural facilities for ecotourism. These activities will provide income generation opportunities for key stakeholders and help develop infrastructure.

Overall, NSP seeks to reduce pressure on the sanctuary and improve the livelihoods of local people as part of a conservation strategy under the co-management approach. All twenty-four settlements located inside the sanctuary are illegal from the perspective of the Forest (Amendment) Act 2000 and the Bangladesh Wildlife (Preservation) (Amendment) Act 1974. According to the existing legal framework, any income generation activities for these settlements will be illegal. It is necessary for the government to amend the existing legal framework before implementing income-generating activities in Chunati Wildlife Sanctuary. In addition, if the government does not revise the National Forest Policy, government policy directives in support of co-management in CWS will be missing.

Cultural aspects. Chunati Wildlife Sanctuary is not particularly rich in archeological and cultural features. The core area of the sanctuary contains human settlements and agricultural fields. Nature and wildlife, betel leaf cultivation, a Muslim shrine, and a small temple are the only resources available for promoting eco-tourism for local people in support of their income generation. Betel leaf cultivation, the shrine and the temple buildings inside the sanctuary are illegal according to existing forest and wildlife law. Even though the National Forest Policy 1994 encourages ecotourism, stating: "Ecotourism, related to forest and wildlife, is recognized as forestry related activity, which will be promoted taking into consideration the carrying capacity of the nature," the cultural landmarks with potential for promoting ecotourism in PAs have largely been ignored.

Community participation. Sustainable co-management in PAs depends on the level of community participation in resource management under enabling policy and legal frameworks. Existing community participation levels in Chunati Wildlife Sanctuary may be characterized by the "participation for material incentives" (Badola *et al*. 2002). Badola *et al*. (2002) mentioned that this type of participation might fizzle out once the material incentives stop flowing to the community after the program or project is over. Without clear policy directives and legal framework, the participation level cannot be sustained, and thus it will lose the process of transforming participation into self-mobilization.

I observed six operational issues with respect to community participation and I reached the following conclusions: (1) local skills for resource management are inadequate to adapt to dynamic social and ecological circumstances, (2) local institutions and social organizations are in an infant stage of formation, (3) local rights and tenure regimes are under strict regulations, (4) local benefit sharing mechanisms in the PA are not developed, (5) resources and technologies to support local needs are limited, (6) knowledge of planning, management and evaluation are poor, and (7) funds for supporting a process-oriented flexible project are limited.

Response from members of the Co-management Council and Co-management Committee

The survey showed that most members of the council and committee did not know or understand the policy and legal framework under which they worked. Most members were not aware of the National Forest Policy 1994, the Forestry Sector Master Plan, or the legal provision under the Bangladesh Wildlife (Preservation) (Amendment) Act 1974. Members from the FD (Assistant Conservator of Forest, Range Officer and Beat Officer) were the only people who were aware of and understood these policy and legal frameworks. Council and committee members had some understanding of the NSP project document and the management plan of the sanctuary. The lack of knowledge of council and committee members about the policy and legal frameworks under which they worked suggests a gap in the operational vision of these local institutions. All council and committee members understood that the co-management initiative being implemented in Chunati Wildlife Sanctuary represented a shift from a top-down blueprint approach to a process learning approach for biodiversity conservation and natural resource management in the sanctuary. In the questionnaire, the majority of respondents could identify variables that are associated with co-management such as locus of decision-making, methods and rules, analytical assumptions, management focus, evaluation processes, relationships with people, and outputs under the learning process approach. None of the respondents, however, could clarify the policy and legal constraints upon their choices. Forty percent of respondents believed that the existing policy and legal frameworks were sufficient to deal with the charter of duties of the co-management councils and co-management committees. The other sixty percent of the respondents disagreed with this concept.

Respondents made several comments about the need for local decision-making authority, local ability to revise the master plan at a limited scale, and the power to approve small projects at the local level. These comments indicate recognition of the need for local authority. None of the respondents, however, knew their responsibilities as outlined according to the charter of duties (for council and committee members) mentioned in the government order. Respondents did not know the legal basis on which the decisions they had taken against activities negatively impacting the sanctuary could be implemented. Respondents could not identify the legal basis for their power to resolve conflicts among co-management committee members.

Response from FUG and CPG members

I randomly selected six members of a FUG and interviewed them using open-ended questionnaires. Half of the respondents were men and half were women, and they ranged in age between 18 to 42 years. Survey data revealed that the academic background of the respondents ranged from class three in primary school to class eight in secondary school. Respondents' land holdings ranged from homesteads to homestead and agricultural land of 0.4 to 0.6 acres and their occupations included cultivators, owners of grocery and teashops, and various forms of self-employment. Respondents had only participated as FUG members for one to two years and within this period they had all experienced increases in their livelihood assets (human capital, natural capital, physical capital, financial capital and social capital). Male respondents had not participated in any other institutions or NGOs, while all female respondents were members of different NGOs.

Bangladesh has been experiencing success stories of women's participation in NGO programs. This trend and the findings of this study suggest that women are gaining greater experience working with NGO activities and micro-credit programs. Female respondents attended training courses on poultry, tailoring, and improved stove preparation, enabling them to become more productive and self-employed and contribute to their household subsistence.

All the respondents have varying degrees of access to local resources such as forestland, water, livestock grazing and forest resources, but their dependence on these resources differs. Interviewees suggested that NSP should respond to needs for

micro-financing, shop renovations, investments in madrashas (Islamic schools) and schools, fruit tree farming, poultry, fish culture, apiculture, machines for tailoring shop, tube wells for drinking water, small culverts, and vocational training. All these local needs and aspirations of the FUG members should be reflected in the national policy directives.

I assessed six dimensions of social capital (groups and networks, trust and solidarity, collective action and cooperation, information and communication, social cohesion and inclusion, and empowerment and political action). I found that the FUG's activities had resulted in increases in all six dimensions of social capital among its members. None of the respondents were aware of the policy and legal documents that constrained NSP's ability to affect the changes they desired in access to different types of social capital.

I determined the vulnerability context of the respondents based on their seasonal pattern of activities and records of severe crisis faced by the interviewees during last ten years. Each of the respondents had faced a crisis at least once during the last ten years. Micro-financing helped them to overcome these situations. The co-management initiative provides provisions for micro-credit and hence helps to improve the living conditions in the sanctuary. Most resource managers considered lack of secure land tenure to be the most important constraint under existing law. The majority of respondents desired clearer land ownership rights. All of the respondents also suggested raising funds for addressing the lean season and assisting during vulnerable situations, similar to those that they have faced in the past.

From the CPG I randomly selected ten members and interviewed them. I observed that the socio-economic conditions of CPG members are inferior to that of FUG members. Landlessness, large families, and subsistence livelihoods characterize CPG households. My results suggest that CPG activities are providing a slight increase in the five types of livelihood assets (human capital, natural capital, physical capital, financial capital and social capital) mentioned for FUG members. CPG members are more vulnerable than FUG members, but their local needs and aspirations are the same. I assessed the different dimensions of social capital and observed increasing trends among all six types. The management plan of Chunati Wildlife Sanctuary can be used to accommodate all these local needs and aspirations of CPG members.

I also participated in the Co-management Council meeting held on April 21, 2007 at Chunati Union Parishad, Chunati. The resolution of the 6th Co-management Council meeting was read and approved by the members present. The Range Officer of CWS presented the annual report for the period from August 24, 2005 to April 21, 2007. During the meeting, I interacted with the council and committee members and found that most of the members are neither aware of existing National Forest Policy and legal framework nor acting on long-term vision. Thus, there exists a significant gap between the policy makers and the local actors in terms of decision-making.

Discussion

The Forestry Sector Master Plan was prepared as part of a long-term strategy to manage and develop forests for environmental stability and economic and social development in the country. To meet these objectives, policy issues were identified, forest related aspirations of the people were studied by an expert hired as a consultant, and a detailed National Forest Policy was promulgated in October 1994. The master plan suggested institutional reforms that sought to broaden people's participation in forest management (see Box 1). The master plan provides strong support for biodiversity conservation and people's participation to prevent illegal occupation of forests, illegal tree felling and hunting of wild animals. National parks, wildlife sanctuaries and game reserves are considered to be the priority PAs. In addition, the policy directives to encourage equity may be relevant to the co-management approach.

Box 1: Forest Sector Master Plan's support for people's participation

Forestry activities are inseparable from local people's basic needs. People must benefit more from development and in a more equitable fashion requiring:

1. Significant re-ordering of priorities through institutional change and a strong focus on effective local public involvement in resource planning decisions, activities and management
2. Introduction of community based resource management programs primarily controlled by and benefiting the resident population
3. Active involvement of positive, effective NGO groups in local development
4. Implementation of reforestation programs with encouragement and assistance on both public and private lands

Source: Forestry Sector Master Plan (1995-2015)

The Forestry Sector Master Plan provides a strong basis for a people-oriented strategy that seeks to support rational land uses based on existing land productivity, manage the environment to preserve existing values, conserve plant and animal varieties, and provide maximum benefits to local people who are dependent on forest resources. Both the Forestry Sector Master Plan and the National Forest Policy 1994 emphasize the concept of people's participation in forestry activities. Following this directive, the Forest Act was amended in 2000 and a new social forestry rule was prepared in 2004. Under this policy perspective, the Forestry Wing was established in the department during the same period. Despite all of this, a policy directive for co-management of PAs is still missing.

According to official records, it is clear that the policy formulation was carried out under a top-down approach having minimum local consultation. As such, local stakeholders could not 'own' this policy. Existing policy processes in the forestry sector are characterized by a distinct policy formulation phase but with poor implementation, monitoring and evaluation phases.

According to Section 2 of the Bangladesh Wildlife (Preservation) (Amendment) Act 1974, "wildlife sanctuary" means an area closed to hunting, shooting or trapping of wild animals. In Article 23 the government describes a wildlife sanctuary to be an undisturbed breeding ground primarily for the protection of wildlife but inclusive of all natural resources, such as vegetation, soil and water. By declaring an area as a wildlife sanctuary, the government has imposed the following restrictions in Section 23 of the law:

> No person shall –
> (1) Enter or reside in any wildlife sanctuary;
> (2) Cultivate any land in a wildlife sanctuary;
> (3) Damage or destroy any vegetation in any wildlife sanctuary or within one mile from the boundaries of a wild life sanctuary;
> (4) Hunt, kill or capture any wild animal in any wildlife sanctuary;
> (5) Introduce any exotic species of animal into a wildlife sanctuary;
> (6) Introduce any domestic animal or allow any domestic animal to stray into a wildlife sanctuary;
> (7) Cause any fires in a wildlife sanctuary;
> (8) Pollute water flowing in or through a wildlife sanctuary.

The Bangladesh Wildlife (Preservation) (Amendment) Act 1974 further stipulates that:

> If a person contravenes or attempts to contravene the provision of Article 23, he or she shall be punished with imprisonment which may, subject to the minimum of six months, extend to one year and also include a fine which may, subject to the minimum of Taka five hundred, extend to Taka one thousand, and his or her hunting license, gun license and shooting permit shall be cancelled. The equipment used in the commission of the offence and the animal meats or trophies found in his or her possession shall be confiscated. (GoB 1974)

Until there is a revision of current policies, co-management in PAs cannot be legitimately introduced and enabling conditions for sustainable co-management in PAs can not be ensured. There are other policy instruments that could be effectively utilized, provided there is a clear national forest policy directive and legal framework. Past experience revealed that more than ten years were required to bring participatory social forestry under a legal framework after the declaration of the policy directive. A similar duration of time might pass if immediate action is not taken by project authorities for the revision of policy and amendments of laws. Indeed, this is one of the main objectives of NSP. Delay in achieving these objectives may jeopardize the overall plan of the project and thus hamper the sustainability of co-management in PAs.

The FD has developed a number of bylaws and management tools – such as government orders, management plans, the NSP Development Project proforma, forest user group guidelines, meeting resolutions, and agreements in support of implementing NSP. But many of these are still in the drafting stage and under consideration for approval by the appropriate authorities. If there is any defiance towards the bylaws and management tools, taking the necessary measures will be difficult due to the non-existence of a clear legal framework. Conflict management is an integral part of co-management and it will be difficult to apply this approach (negotiation, mediation and arbitration) without the existence of a legal framework.

The participation of local communities is a very important issue in co-management of PAs. Policy directives and legal frameworks need to be oriented to ensure improved participation – including function participation, interactive participation and self-mobilization of local needs, aspirations and overall livelihood strategies.

Conclusion

This case study reveals that existing National Forest Policy directives and legal frameworks are constrained in achieving the objectives of co-management in PAs. This is because of the absence of provisions enabling co-management in the policy directives and strict measures for the exclusion of stakeholder participation in PA management, especially for the sanctuary management. NSP has developed bylaws and management tools – some of which are approved and others that are undergoing the approval processes. As part of NSP, the Ministry of Environment and Forest has also issued an important government order to form the Co-management Council and Co-management Committee. In absence of this project there would be no legal basis for the existence of these local institutions.

The majority of members of the Co-management Council and Co-management Committee are not aware of the National Forest Policy and Forestry Sector Master Plan. They know some of the legal provisions of the forest act but most of them are not aware of the Bangladesh Wildlife (Preservation) (Amendment) Act 1974. This reveals that there is ignorance amongst local decision-making actors of the national policy directive and legal provisions, indicating a major gap in understanding of the government's vision. FUG and CPG members are actively responding to the project activities but not capable of defining the legal constraints that prevent them from achieving their aspiration and meeting local needs.

Participation of local stakeholders was minimal in the preparation of the National Forest Policy 1994. With local participation, the FD needs to take immediate measures to revise the National Forest Policy 1994 to give clear policy directives to incorporate the concept of co-management into PAs and develop policy ownership. At the same time, it is necessary to amend the Bangladesh Wildlife (Preservation) (Amendment) Act 1974 in order to bring the co-management concept within the legal framework. As a result of such changes, other policy instruments could effectively be utilized in the successful implementation of co-management initiatives in Bangladesh. If these legal changes were made, local institutions for co-management – such as the CM Councils, CM Committees, FUGs, and CPGs – would be better able to define their roles and responsibilities and arrange local benefit sharing mechanisms to sustain the program on a clear policy directive and

strong legal basis. This would help ensure the sustainability of co-management initiatives in PA management in Bangladesh. Therefore, NSP should give priority to undertaking necessary actions to prepare appropriate policies and constituencies, which are required in order to achieve other objectives of the project.

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Governance through Protected Area Conservation Co-Management Committees: A Case Study at Lawachara National Park

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Abstract

Bangladesh has one of the lowest ratios of per capita land under protected areas (PAs) in the world. Nonetheless, these remnants of forest support the livelihoods of a large number of neighboring populations. Moreover, the Bangladesh Forest Department (FD) has recognized that the exclusion of local people from PA management has actually contributed to the steady loss of valuable biodiversity. In response to this realization, the FD initiated the Nishorgo Program as a broad-based institutional platform for collaborative management of PAs. This platform provides for the inclusion of FD officials as well as other key stakeholders in PA management; creating space for active participation in the sharing of benefits, decision-making and power; and making representatives accountable for their responsibilities and for fostering a transparent institution. This study of co-management implementation in Lawachara National Park reveals that five years is enough time to launch a successful project, but not enough to make a new institution self-sustaining. Moreover, the shift from a strict conservation approach to a co-management approach requires the strong commitment of all parties. Despite some inherent challenges, responses from diverse local stakeholders and representatives reveal a strong potential for local co-management institutions to ensure good governance in the management of Lawachara and other PAs.

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Introduction

Sustainable protected area (PA) management requires the participation of local people in decision-making processes, the devolution of power, the equitable sharing of benefits, and institutions that are both transparent and responsive. These are key principles of good governance. The Australian Agency for International Development (AusAID 2000) views good governance as "the competent management of a country's resources and affairs in a manner that is open, transparent, accountable, equitable and responsive to the people's needs." Collaborative management (co-management), a process of sharing responsibilities and decision-making power with multiple stakeholders, has the potential to contribute significantly to good governance. Borrini-Feyerabend *et al.* (2000) define co-management as "a situation in which two or more social actors negotiate, define and guarantee among themselves a fair sharing of management functions, entitlements and responsibilities for a given territory, area or set of natural resources."

The Nishorgo Support Project (NSP) is a comprehensive program aimed at improving the management and governance of PAs in Bangladesh. NSP is jointly implemented by the Forest Department (FD) and the United States Agency for International Development (USAID). It is a five-year project (2004-2009) that focuses on building partnership among the FD and key local, regional and national stakeholders. The communities living in and around the NSP sites represent heterogeneous groups of people from diverse backgrounds and geographic origins, with unequal status, interests and power. NSP faces the challenge of uniting these diverse groups into a single institution through the creation of a common local institutional platform for the management of forest resources in PAs. This platform, known as the "Nishorgo Co-Management Institution", is a three-tiered structure comprised of a Protected Area Conservation Council (hereafter called "Council"), a Protected Area Conservation Co-management Committee (hereafter called "Committee"), and forest user groups (FUGs). The Committee plays a pivotal role in promoting sustainable biodiversity conservation through facilitating effective collaboration among these and other actors.

The involvement of multiple stakeholders forms the basis for effective natural resource management regimes and good institutional governance. For example, the

Forest Protection Committees (FPCs) of India's Joint Forest Management program in West Bengal address the immediate survival needs and benefits derived from non-timber forest products. This focus on direct benefits to FPC members has helped to ensure the long-term sustainability of the Joint Forest Management system. Similarly, community forest user groups (CFUGs) in Nepal have proven to be successful institutions for community based natural resources management. The CFUGs provide an effective local institutional platform to manage and regulate the use of forests adjacent to settlements (Springate-Baginski *et al.* 2000). Many CFUGs have consolidated their role as resource management institutions and are now branching out into wider community development activities in an effort to reduce social and gender inequality. Indian FPCs and Nepalese CFUGs have proven that concerted struggle and the mobilization of poor local forest communities can ensure their rights. These institutions thus serve as effective multi-stakeholder resource management models. Co-management has also been successfully practiced on a limited scale in the Management of Aquatic Ecosystems through Community Husbandry (MACH) project of Bangladesh to promote the conservation and sustainable management of critical floodplain and wetland habitats (USAID 2006).

This paper focuses on the Protected Area Conservation Co-management Committee of Lawachara National Park (LNP). The Committee is composed of 15 to 20 members selected from the Council with representation from ethnic communities, community-based organizations, local government officials, non-government organizations, local elites, resource-owning groups, law enforcement authorities and government departments. Representatives of the FD serve as conveners of this multi-stakeholder body. The Committee faces the great challenge and responsibility of bringing conflicting stakeholders to consensus. This study uses a framework of good governance characteristics to evaluate the potential of the Committee for ensuring effective forest governance. Understanding and mobilizing this potential is critical for promoting the functionality of a new multi-actor management regime in a sector that was previously managed by the FD alone. This research concludes that the Committees have the potential to ensure good governance for sustainable conservation of biodiversity in LNP and other areas of Bangladesh.

Background

The Bangladesh FD first introduced community-based social forestry programs in the early 1980's with a view to alleviate poverty and regenerate forests in both denuded and encroached reserve forests and other ecologically marginal lands. At the end of the twentieth century, social forestry has become the dominant strategy in the country's forestry sector, with remarkable success (Niaz 2001). This success has influenced policy-makers and development partners to introduce collaborative forest management in five protected areas of the country under the framework of NSP. The Forest Policy (1994) emphasizes a shift in forest management objectives from timber production to four joint objectives: (a) preservation of ecological functions; (b) conservation of biological diversity; (c) meeting the consumption needs of local people; and (d) provision of other important forest services (Sharma *et al.* n.d.).

The FD, which has statutory authority over the management of Bagladesh's forest resources, suffers from insufficient manpower and lacks modern firearms to combat organized timber poachers. Local communities have also accused FD officials and staff of being complicit in the process of forest destruction (Huda n.d.). The command-and-control policy approach of the FD restricts the role of communities in forest management, as well as their ability to reap benefits from forests. As a result, deforestation continues unabated. In 2004, the FD introduced the Nishorgo Program, which has focused on implementing co-management initiatives in five pilot PAs by building equitable partnerships between the FD and other key local, national and regional stakeholders. This program is assisting the FD to conserve biodiversity through the development of facilities, management capacity and strategic partnerships.

LNP is a PA comprised of semi-evergreen and mixed deciduous forests in Moulavibazar District. The park covers 1,250 hectares of low hills with a unique biodiversity comprised of approximately 167 flora species, 246 birds, 4 amphibians, 6 reptiles and 20 mammal species (Mollah and Kundu 2004), including the hoolock gibbon as a flagship species. The park was created in 1996 under the Wildlife (Preservation) (Amendment) Act of 1974. There are a total of 16 villages surrounding the park (within 5 km of its boundaries), consisting of approximately 2,255

households (NSP 2005). The park is home to the Khasia, an ethnic community found in northeast Bangladesh and India. A few Bengali villages lie adjacent to the eastern side of the park and two Khasia villages are located within its boundaries. Six tea estates border the park on the north, west, south and southeastern sides. The reserve forests along the southern border with Habigonj and Moulavibazar Districts contribute substantially to the national timber supply.

Nishorgo has identified all the major stakeholder groups and included their representatives in the first tier of the of co-management institution: the Co-Management Council. Among local stakeholders are approximately 10 to 12 influential *mahalders* (timber traders) from Criminal Bazaar and 15 to 20 from Bhanugach Bazaar. There are also 9 sawmills located in Kamalganj, and 12 in Sreemongal. These industries engage local people in the illegal removal of trees from the national park and adjoining forests. At least 35 influential people from the local government and from the elite class (including local politicians, mahalders and sawmill owners) exert influence on the PA through their membership in the Council itself (Nishorgo 2005).

According to NSP, the Council forms the first tier of the Nishorgo Co-management Institution and is responsible for management of the PA landscape. A broad-based structure, it should consist of about 50 members from different socio-economic strata of the local communities. However, the Council members are not directly elected by community members. The Committee forms the second tier and is comprised of up to 20 members who are elected by and from the Council members themselves. The Committee plays a pivotal role in promoting sustainable biodiversity conservation by facilitating effective collaboration among stakeholders. The FUGs, the third tier, represent local grassroots organizations. In all, there are now 43 FUGs formed in and around Lawachara National Park, with a total of 609 general members.

About the Committee

The Committee of LNP received its legal status via a gazette notification from the Ministry of Environment and Forests (Government of Bangladesh 2006). The government promulgated this order exclusively for the five pilot PAs under NSP, including Lawachara. The gazette notice emphasizes that the Committee will act as

an executive body that is accountable to the Council. It also stipulates that members of the Committee will be elected for two-year terms, except for the secretary and representatives of law enforcement authorities. Table 1 below illustrates the actual (current) number of representatives from each of the designated stakeholder groups on the Council and the Committee, as well as the designated number of members from each group on the Committee.

Table 1: Actual and designated number of representatives from each stakeholder group in the Co-management Council and Co-Management Committee of Lawachara National Park

Stakeholder group	Actual No. of Council members	Designated No. of Committee members	Actual No. of Committee members
Local government	12	4	4
Local elites, including Journalists	7	2-3	4
Resource owning groups	5	2	2
Forest user groups and federations	9	2	2
Local youth	2	1	1
Indigenous/ethnic communities	3	2	2
Law enforcing authorities	2	1	1
Forest Department (ACF/RO)	2	1	1
Local NGOs/CBOs	5	1	2
Other government agencies/departments	4	2	0
Total members	51	18-19	19

Note: The Upazilla Nirbahi Officer, UNO acts as President of the Co-management Council and Advisor (*ex officio*) of the Co-management Committee.

Specific responsibilities of the Committee as per the 2006 gazette notice are to:

1. Act as the executive body of the Council and be accountable to the Council for its activities;
2. Serve as a liaison between the FD officials/staff and the local people in the management of the PA;
3. Distribute shares from the benefits derived from the PA among the groups involved according to the procedures developed by the Council;
4. Assist the FD in deploying laborers from the forest user groups in development activities undertaken by NSP;
5. Prepare and submit proposals to the respective authorities pertaining to the development of the PA and its landscape zone;

6. Develop work plans for spending funds generated locally from the management of the PA, and participate in the expenditure process approved by the concerned Divisional Forest Officer (DFO);
7. Maintain income and expenditure accounts of locally collected funds, and solicit audits with a firm prescribed by the advisor;
8. Undertake necessary measures for forest protection and other purposes in the PA according to the instruction of the DFO; and
9. Facilitate resolution of conflicts among local people, the FD, and other government organizations and NGOs.

Good governance principles and conceptual framework

The Fifth World Parks Congress identified effective governance to be "central to the conservation of protected areas throughout the world" (WCPA 2003). International conventions, treaties and protocols, such as the Convention on Biological Diversity (CBD), the World Heritage Convention, the Ramsar Convention on Wetlands of International Significance, and the Man and Biosphere Program of UNESCO all suggest that local-level, multi-stakeholder institutions are vital for effective PA management. Though it is difficult to define good governance principles, Graham *et al.* (2003) have identified five principles based on characteristics recognized by UNDP. Similarly UNESCAP (2007) identified eight major characteristics of good governance regimes: inclusiveness, participation, consensus-orientation, accountability, transparency, responsiveness, effectiveness and efficiency, equity and adherence to rule of law.

Table 2: Characteristics of good governance (based on Graham *et al.* 2003)

Characteristic	Corresponding UNDP & UNESCAP principles	Four characteristics used in this study
Performance	Responsiveness, inclusiveness, effectiveness & efficiency	1) Inclusiveness – institutions & processes try to serve all stakeholders
Legitimacy and voice	Participation, consensus-oriented	2) Participation either directly or through legitimate intermediate institutions
Direction	Strategic vision	--
Accountability	Accountability, Transparency	3) Accountability–decision-makers are accountable to the public as well as to institutional stakeholders, 4) Transparency– free flow of information
Fairness	Equity and inclusiveness, rule of law	--

The principles of good governance overlap and strengthen each other. This paper focuses on four of these governance principles: inclusiveness, participation, accountability and transparency. These categories were selected after a review of the literature (see Table 2) and defined based on the terminology used by the UN agencies mentioned above. A brief description of these four principles follows.

Inclusiveness implies that a society's well-being depends on ensuring that all of its members feel they have a stake in the process of co-management and do not feel excluded or otherwise marginalized. This requires that all groups, but particularly the most vulnerable, have opportunities to improve or maintain their own well-being.

Participation is the cornerstone of good governance. It ensures that all men and women have a voice in decision-making, either directly or through legitimate intermediary institutions or representatives. Such broad participation is built on the principles of freedom of association and free speech, as well as a belief in individual capacities to participate constructively.

Accountability implies that decision-makers in government, the private sector and civil society organizations are accountable to the public, as well as to institutional stakeholders. Who is accountable to whom varies according to whether decisions or actions taken are internal or external to an organization or institution. In general, an organization or institution should be accountable downward to those who will be affected by its decisions or actions. Accountability cannot be enforced without transparency and rule of law.

Transparency means that decisions, and their monitoring and enforcement, are carried out in a manner that follows existing rules and regulations. It requires the free flow of information and easily understandable forms of communication and media. Processes, institutions and information are directly accessible to those concerned with them, and enough information is provided to understand and monitor them.

Methodology

This study focuses on the Committee of LNP and seeks to determine whether implementation of its activities and programs is in harmony with both nature and the aspirations of local people. I conducted an in-depth study to observe how the Committee was formed, its legal foundations, its implementation mechanisms, and its influence on management of the PA. I evaluated the Committee according to the four major principles of institutional good governance described above: inclusiveness, participation, accountability, and transparency. Above all, I assessed the effectiveness of the Committee as the nodal body of Nishorgo institutions.

I chose LNP as the study site because it is one of the five pilot PA sites of the Nishorgo program. Prior to beginning the study, I visited Lawachara to learn about the biophysical conditions of the park, and to familiarize myself with the administrators and other actors who influence its management. From January to June 2007, I conducted open-ended, interactive interviews with Committee members, Council members, user group members, key informants and Nishorgo officials. I analyzed responses from the interviews and from focus group discussions qualitatively. I also attended Committee meetings and Council meetings to understand the interactions among official members and representatives. I discussed the Nishorgo Program with forest villagers of different ethnic groups, with villagers from Dolubari, and with members of a patrol group. I also reviewed the minutes of my Committee meetings, Nishorgo documents, scientific journal articles and relevant web sites during the course of the study. Since I am an employee of the FD, the interviews are not free from bias. However, I tried to minimize partial or misleading information from the interviewees by cross-checking with other respondents as much as possible. Discussions with Committee members and key informants were based on a checklist, which included questions concerning the co-management of PAs, the legal basis of Nishorgo institutions and the Committee itself: its functionality, sustainability and the extent to which it complies with the four good governance principles outlined above.

Results and discussion

This study reviews the legal and operational support available to the Co-Management Committee, and evaluates its functionality as a co-management institution according to the four characteristics of good forest governance. It also focuses on the strengths and weaknesses of the institutions with respect to conflict resolution, involvement of local stakeholders in formulating the Annual Development Plans (ADPs), dealing with corruption, facilitating NGO involvement, and ensuring the sustainability of the Committee in the long term.

Legal and operational support to the Committee

The existing Forest Policy (as of 2004) calls for the expansion of PAs to 10% of national forest lands by 2015, but does not recognize multi-stakeholder or "collaborative management" of the PAs. In 2006, the third year of the Nishorgo program, the Government of Bangladesh made a gazette notification for the formation of specific NSP institutions – namely the "Co-management Council" and the "Co-management Committee" – which established the legal basis for co-management in the PAs. However, these bodies have been involved as informal institutions since the beginning of NSP in 2004. The notification is limited to NSP sites and the duration of the project. However, ongoing policy support is critical for the sustainability of these institutions at LNP and the four other NSP pilot sites after the project ends in 2009. The Nishorgo Program is assisting the Committee to obtain registration under the Societies Registration Act of 1860. This registration will allow the Committee to operate like an NGO and to seek funds from different sources to ensure its long-term viability.

Functionality of the Committee

Since its initiation in early 2006, the Council has been comprised of 51 members, with the Committee consisting of 19 members elected from the Council, as shown in Table 1. According to the gazette notification of 2006, the Council and Committee are assigned specific responsibilities. The Committee holds regular monthly meetings, as well as separate meetings for special purposes, such as the preparation of ADPs. The meetings are held at the Committee office, located inside LNP. The executive body of the Committee, the Council, has a group charter outlining its

duties, as mentioned above, but there are no position-specific responsibilities noted for individual Committee members. This lack of individual mandates impairs the effectiveness of Council members in implementing NSP activities and makes it difficult to assign specific duties to individuals.

To align the FD as a stakeholder in the Council and the Committee, local FD officials, such as the Divisional Forest Officer (DFO), the Assistant Conservator of Forests (ACF), the Range Officer and beat officers, should be incorporated into the Nishorgo institution. At present the ACF/Range Officer is acting as the secretary of the Committee, but the DFO and field-level beat officers are not included in either institution. However, the DFO, ACF, Range Officer and concerned beat officers should all be members of the Council. For instance, the ACF could be the member secretary of the Council and the Range Officer could be the member secretary of the Committee.

Inclusiveness

The inclusiveness of an institution refers to the extent to which every section of the community is included in the process of resource management, and the extent to which their welfare and access to resources are addressed. The Committee on National Parks and Protected Area Management identifies "the inclusion of a diverse range of people and interest groups" as the best means for promoting public participation in PA management and decision-making processes (CNPPAM 2002). Hence, making the Nishorgo program more inclusive requires that representatives from all stakeholder groups are included in the co-management process. This applies particularly to those groups who are typically marginalized by the management interventions, such as women, children, and the poor. NSP documents have identified the FD as the statutory authority of LNP and have also specified other key stakeholders, as listed in Table 3 below. Some resource user groups are not well represented in the Committee, resulting in the lack of participation by some important primary stakeholders, particularly fuelwood collectors.

Table 3: Key primary, secondary and tertiary stakeholders at Lawachara National Park

Primary stakeholders	Secondary stakeholders	Tertiary stakeholders
• Poor people living inside the forest (i.e., ethnic communities- Khasia, Tripura,etc.) • Collectors of fuelwood, bamboo and other housing materials (mainly women and children) • Illegal timber fellers • Timber traders	• Sawmill owners, • Brickfield owners • Furniture shop owners • Mahalders*	• Local government representatives (Union Parishad) • Law enforcement authorities • Laborers from tea estates • Land encroachers

*Note: Mahalders are timber traders who bid to harvest portions of reserve forests on site (Source: Nishorgo 2005)

NSP was well received at the beginning of the co-management process, and the Committee members (respondents of this study) are also satisfied with the selection of stakeholders – none mentioned any omissions or inconsistencies in stakeholder identification. On the other hand, a large segment of local people from ethnic communities and neighboring villages are either seldom heard from or negatively affected by NSP initiatives. For example, one patrol team member from a Khasia village argued that they have been required to conduct more intensive patrolling since NSP was begun. The Khasia forest villagers used to accompany FD patrol teams to help prevent the illicit removal of timber and other restricted forest products, even before the initiation of NSP. However, this collaboration leaves the Khasia less time for betel leaf cultivation, which is their main income source. Furthermore, their access to *jhum* (forest fallows) for collection of mulch is more restricted now.

Forest villagers also reported that field-level forestry officials and experts from both International Resources Group (IRG) and Rangpur Dinajpur Rural Service (RDRS)[1] – a collaborating NGO that is engaged in social mobilization to conserve forest resources and biodiversity – display a negative attitude towards betel leaf cultivation. In fact, one NSP document identifies betel leaf cultivation by Khasia communities as a threat to forest resources and ecosystem integrity (NACOM

[1] The International Resources Group (IRG), a contractor of USAID, provides technical support for designing and implementing the co-management model in association with the FD and other stakeholders. Rangpur Dinajpur Rural Service (RDRS) is a local NGO working as a sub-contractor of IRG for field implementation.

2003, Feeroz and Islam 2000). From the point of view of good governance, the inclusion of Khasia communities in NSP co-management has not improved their well-being, but rather hampered their means of livelihood. My interactions with the Khasia headman (*montri*), as well as with the larger Khasia community, revealed that he is a vulnerable member in the Committee and cannot freely raise this issue. Since the FD and USAID have adopted co-management as a strategy for management in LNP, they remain the Park's sole custodians. As a result of their negative attitude towards betel leaf cultivation, members of the Khasia community are suffering a loss of livelihood means.

In short, Committee members still do not have clear ownership over decisions concerning LNP, as they and the FD personnel are merely managers of the resources. Consequently, Committee members are not seriously engaged in decisions about the Park. The FD and NSP authorities lead all major management efforts and decisions, whereas Committee members only participate in their execution.

Participation

Participation is viewed as a process involving local stakeholders in the formulation, implementation and benefit-sharing of a program or policy. In principle, it acknowledges the use of local capacities and rejects the setting of priorities by external parties. At LNP, the major stakeholders, through their representatives in the Committee, have the potential to enjoy the responsibility of shaping their own futures. Committee members are all elected directly from the Council. However, they confirmed that the basis for their inclusion in the Council was their awareness of the situation at LNP and their involvement with NSP since its inception. All of the Committee members were selected from among local elite; no representatives of grassroots constituents were included. Despite this fact, Committee members assert that they represent diverse groups of stakeholders, including the grassroots group of primary forest users.

However, Committee members have demonstrated the attitude that grassroots-level forest users have little influence and are unable to contribute to society, even if they are trying to conserve biodiversity for the benefit of other local people. In reality, the most forest-dependent users are often excluded from decision-making

processes and have little chance to be elected to these positions. Although the 19 stakeholders identified by NSP were selected through a transparent and systematic process, representation of all of their interests through the Committee is not yet apparent in the meetings or the interviews, and the voices of the marginalized are yet to be heard. For instance, although poor local fuelwood collectors have a major stake in LNP, they have no representation on the Committee.

It is hard to trace the actual change in forest management during the shift from a command-and-control system implemented by the FD to a co-management approach with representative committees. The change has not occurred spontaneously through local peoples' own aspirations, but rather via prescriptions from above and outside the local community. These prescriptions are imposed by the donor agency through the FD in order to promote effective conservation, but the changes that have taken place so far are largely superficial. Although there is significant scope for change, and many responsibilities to distribute among the local stakeholders, the system is clearly lacking in terms of devolution of both administrative and financial powers.

The Committee has held regular meetings on various issues. Like other discussion forums, a few members are always vocal, while others have their views suppressed or simply observe the flow of the meeting. In the end, the decisions typically come from the NSP or FD representatives, or from the meeting chair. It seems that these authorities hear the views and complaints of the participants of the meeting, and usually conclude the discussions with a polished and/or very technical remark, which is often so bureaucratic that it is meaningless to most participants. In some cases, the discussion turns into accusations against NSP or the FD, which are usually struck from the meeting minutes. The members have voiced their reservation about the quality of documentation of discussions in the minutes. Although the Committee members affirmed their unified efforts for the sake of LNP during individual interviews, I found that personal conflicts and interests sometimes came to the forefront in Committee meetings.

Furthermore, there is currently no mechanism to link the Committee members to the communities they represent. Hence, local people are seldom aware of NSP activities and decisions. Since the representatives in the Committee are all elites – either from society and the local administration or from local political groups – the

voice of marginalized groups remains unheard. Interviews with women and NGO representatives showed that they do not even know the constituencies they represent, or the full scope of their responsibilities. The Committee members are not provided with specific written responsibilities, nor are they aware of the Committee's general scope of work. As a result, the representatives do not serve the interests of their constituencies or provide them with any direction concerning the conservation of LNP. In some cases, the participation of local representatives appears to be passive. In one instance, a member of the Committee accused the Committee's leadership of acting merely to approve all decisions taken by the FD and RDRS. This individual felt that they have no say in decision-making and that their recommendations are intentionally excluded from meeting minutes.

While cross-checking the remarks from interviews with elite individuals with Committee members, I found that elite members of the local administration and politics often became involved in NSP activities in order to retain their social status and prestige. They feared losing their long-standing influence if they were not associated with NSP and felt their inclusion in the Committee was the best way to influence the new administration to maintain their vested interests.

Accountability

Following the Durban World Parks Congress, Borrini-Feyerabend (2004) identified co-management of protected areas as a new type of governance based on "who holds management authority and responsibility and can be held accountable according to legal, customary or otherwise legitimate rights". The Durban Congress sets accountabilit' as a good governance principle and defines it as "having clearly demarcated lines of responsibility and ensuring a transparent flow of information about processes and institutions" (IUCN 2004).

I studied institutions like the FD, NSP, RDRS and the newly formed Committee to evaluate their accountability in the co-management process at LNP. Formation of the Committee is identified as a positive step toward a good institutional framework for forest governance. Official documents show that the Committee is accountable to the Council, the first tier of the Nishorgo institution. However, discussions with Committee members and key informants revealed that there is no clear sense of to whom the Council is accountable. Moreover, the Committee lacks

a clear process of accountability to the Council, and individual Committee members are in no way accountable to the constituents they are intended to represent.

NSP has yet to develop a bridge to narrow the gap between the Committee representatives and their communities. The role of the facilitating NGO, RDRS, is primarily to build the capacity and awareness of the Committee members and to organize communal meetings. Furthermore, the specific responsibilities (i.e. terms of reference) of individual Committee members, including the devolution of adequate administrative and financial power, need to be elucidated in management documents. Meetings of the Committee often overlook the urgent needs of the people. For example, the Khasia community routinely asks for irrigation facilities and *arot* (warehouses for wholesale dealers) for betel leaf production and marketing. These requests could be channeled through the Khasia community's own *dorbar* (community hall) meetings to the Committee via their montri.

The Co-management Committee should also represent the poor female fuelwood collectors from villages inside and surrounding LNP. However, the sole female representative on the Committee has no contact with local women and thus cannot raise their concerns to the Committee. Due to such weak or non-existent downward linkages between Committee members and their constituencies, the broader needs of the community remain unheard and local people do not respond to the Committee's directives. There is a strong sense of urgency, both within the Committee and among its constituents, to clarify the responsibilities of individual Committee members and to build greater accountability into their scopes of work. Several leading scholars have stressed that the effectiveness of local governance depends on the degree to which local government authorities involve FUGs in decision-making processes, and the extent to which they are downwardly accountable to the user groups (Blair 2000, Agrawal and Ostrom 2001, Larson 2004, Ribot 2004). Some have also stressed that, as long as FD representatives in the Committee and their staff are not fully accountable to the Committee, there is no effective mechanism for conflict resolution. This affects the functionality of the Committee in particular, and of good governance in general. If forestry personnel are involved in the illegal removal of forest products, the Committee has no legal recourse to make the FD accountable and can merely report to the concerned authority, the department's own DFO. Furthermore, the FD has failed to build sufficient rapport

and trust with the Committee by not taking effective action against dishonest staff members. At the same time, some remarkable progress is now visible in the accountability of the FD's practices. For example, in timber poaching cases, the FD used to arbitrarily identify poor local people as the poachers and deal with them according to their own protocols, whereas they now give the Committee a say in what should be done with arrested timber poachers prior to filing a police case against them.

The FD, Nishorgo and RDRS have yet to work out the details of their collaboration for the management of LNP. With the advent of multi-stakeholder management, FD personnel believe that they are now less accountable for the loss of trees since the local community now shares this responsibility under NSP. On the other hand, local forest users and the poor are largely unaware of the program's activities. RDRS is in a position to facilitate the formation of an institution where all the parties are both enabled and accountable. Currently, the Committee is neither efficient nor fully accountable to its various constituents; not only in terms of whether particular services are available (e.g., serving as liaison between officials/staff and local people, preparation of proposals for development work, maintaining income/expenditure accounts, and resolving conflicts among stakeholders), but also in terms of how and by whom these services are provided.

Transparency

Transparency is recognized as the central pillar of good governance (World Bank 2000). It can serve as a strategic entry point for improving governance of local institutions. Promotion of transparency in resource management enhances the participation of local stakeholders, the responsiveness of local institutions, and the accountability of public representatives. Conversely, the lack of transparency in resource management initiatives aggravates the situation of the poor and marginalized communities that depend on the resources. UNDP (1997) defines transparency as a component of a system that, "Allow[s] stakeholders to gather information that may be critical to uncovering abuses and defending their interests. Transparent systems have clear procedures for public decision-making and open channels of communication between stakeholders and officials, and make a wide range of information available."

Transparency does not occur in traditional command-and-control approaches to PA management, whereby local people are kept out of the management process. Through co-management, NSP has created access to information for all stakeholders. Transparency also facilitates the sharing and development of ideas and plans among stakeholders for PA management. A transparent program can easily sway people to support its process and promote joint efforts for responding to common priorities and concerns. However, the Committee at LNP has yet to prove the financial transparency of its executive members.

In Committee meetings, neither representatives of the FD nor RDRS responded to the members' questions about the total budgetary allocations for development of the park during the 2006-2007 period. However, the Committee soon realized the importance of the issue and followed up on the matter. While conducting an interview at the office of the secretary of the Committee, I found the latest ADP (2007-08) and the allocated budgetary information posted on the wall. In contrast to the previous year, FD and NSP experts guided the Committee members in preparing the 2007-2008 ADP for Lawachara.

At the inception of NSP, local authorities assured the local poor, especially those involved in the illegal removal of trees, that they would rescind any cases currently filed against them. This verbal declaration was made to solicit their participation in patrolling teams. In good faith, the people came forward and joined the teams, but NSP did not deliver on its promise. As a result, the appreciation and credibility that NSP earned as the project that successfully brought 'poachers to protect [the] forest' (Reuters 2007) is being lost. Similarly, the Committee hopes to be able to capture at least 50% of locally-generated funds in order to ensure its own long-term sustainability. Indeed, the initial NSP proforma (2003) affirmed that "50% of parks revenues, including entrance fees, would be retained locally and reinvested in PA management and local community development efforts according to the prescription worked out by Co-management Committees." However, the government has yet to implement this revenue-sharing scheme, even in the final year of the NSP project. The pro forma was formally approved by the Government of Bangladesh in 2005, and the information therein has already been disseminated among local stakeholders, so it is imperative that steps be taken to address this oversight as soon as possible.

Other observations

Conflict resolution – Increased competition by multiple stakeholders with diverse interests can result in conflict over managing resources. In light of this, the institution responsible for management should anticipate and respect the needs and aspirations of all key stakeholders whose livelihoods are dependent on the resources. So far, the FD, as a statutory authority, has not fully given up the command-and-control approach and continues to exclude people from the management process. Previously, there were conflicts between the FD and other stakeholders, but now new forms of conflict are evolving among the different local stakeholders. The hope is that the Committee has brought all relevant parties into a single institutional platform and that all have consented to work together in this changed context. However, the Committee must still identify specific responsibilities for each member, strengthen their capacity and empower them. The Committee can also play a constructive role in conflict resolution, as illustrated by the resolution of conflicts between LNP patrol team members of Lawachara Punji and Radhanagar village.

Formulation of ADP 2007-08 for LNP – In a meeting involving the FD, NSP and RDRS, technical experts of the project assisted the Committee members in preparing their ADP for June 2007 to May 2008. Their participation in four working groups to prepare the ADP demonstrated their active engagement and sharing of responsibility for the management of LNP. This session contributed significantly to the building of the Committee members' capacity for preparing their own development plans and prioritizing their needs. In the future, they should be involved in all stages of the development, planning and implementation of programs.

Handling of corruption by FD personnel – Open-access natural resources often encourage corruption by officials and policy makers, while the resource base remains inadequate to meet local demands. A similar picture is reported by Dr. Ajit Banerjee of the Forest Integrity Network (2002): "We are trying to motivate some of India's top political leaders to fight corruption through citizens' watch activities." He emphasized two types of crimes involving local officials: complicity in wood smuggling and use of government funds for personal gain.

Committee members are aware of the involvement of local forest staff in the illicit removal of forest products at LNP. However, the Committee and Council cannot take any legal action against such activities, and high officials in the FD have not made any effort to resolve the issue. The Committee has introduced a joint team of FD staff, forest villagers and local people for patrolling in and around the park. This multi-party patrolling team provides a system of checks and balances (i.e. the members prevent one another from being involved in the illicit removal of trees) and has brought positive results in controlling illegal activities in the park.

The role of RDRS in NSP initiatives – Some of the major duties of RDRS include mobilization of stakeholder groups, awareness-building, organization of local campaigns, and provision of training for alternative income-generating activities (AIGAs). Local RDRS officials expressed their satisfaction in bringing about remarkable social change, with support from the FD and local stakeholders. RDRS is actively working to develop a sense of resource ownership among local communities by assisting local institutions in preparing their own development programs. However, my fieldwork revealed two shortcomings of RDRS: failure to link NSP endeavors with local people, and inappropriate selection and implementation of AIGAs. To address these deficiencies, established micro-credit NGOs should become involved in the funding of AIGAs.

In consultation with other representatives, I found that there is still a substantial communication gap between the Committee members and the people who they represent. RDRS, as the facilitating organization, could help ensure that the Committee members consult with their respective communities and constituencies before the Council/Committee meetings; and also disseminate the decisions of the meetings to their communities. This effort could be introduced within the tribal communities. Both Committee members and AIGA recipients expressed their frustration with the AIGA support provided by NSP and called for better integration of the process with local communities' needs and aspirations. For instance, the montri could hold community meetings before and after the Committee meetings. This would help to ensure broader participation by the community members. Furthermore, RDRS should support AIGAs in a more strategic and concerted way through extensive participation, training and supervision.

Sustainability of the Committee – Forests in Bangladesh, particularly PAs, are under intense pressure and face constant threats to their sustainability. The Bruntland Commission (1987) defines sustainable development as development that "meets the need of the present without compromising the ability of future generations to meet their own needs." In this context, the FD and associated institutions, especially the Committee, are responsible for meeting the long-term needs of people living in and around PAs. At this stage, the institutional sustainability and effectiveness of the Committee – an organization responsible for the conservation of biodiversity in LNP – is questionable. In light of this, the general opinion of respondents is to take the following actions:

1. Resolve the cases filed against the patrol teams, according to the prior commitment of the FD and Nishorgo officials;
2. Create a revolving fund (equal to 50% of park revenues) for the stakeholders by raising revenue from eco-tourism activities in LNP (This fund would both receive income from eco-tourism and disburse funds to spend on development of additional tourism facilities'); and
3. Extend NSP for a few more years so that the Committee has more of an opportunity to strengthen itself and ensure its own institutional sustainability.

Conclusion

This study reveals that the Committee, along with the FD management staff, has the potential to ensure good governance for sustainable conservation of biodiversity in LNP. Since this Committee is only two years old, it is too early to fully judge its functionality and compliance with the four good governance principles: inclusiveness, participation, accountability and transparency. The temptation to make a grand display of short-term, site-specific successes such as "poachers protecting the forest" should be avoided. However, as a co-management institution under NSP, the Committee could serve as a viable platform for a multi-party resource management regime, comparable to Joint Forest Management in India and Community Forestry in Nepal.

Despite its apparent promise, there are still many issues, concerns and potential barriers to the effective implementation of co-management in LNP. First, the

Committee platform lacks broad-based policy support. Second, co-management in Bangladesh is still a top-down process, since the local institutions remain dependent on external funds, and co-management is not an outcome of local initiatives. Third, the Council and the Committee follow a weak democratic process in the selection of their members. Fourth, these co-management bodies are yet to be freed from the command-and-control mentality and from domination by local elites. Fifth, the Committee lacks adequate participation and representation by certain stakeholders, such as female fuelwood collectors. Sixth, accountability of Committee members to their constituents remains inadequate. Seventh, there is no clear delineation of the responsibilities of individual Committee members or the devolution of administrative and financial powers. Finally, and above all, there is no clear mechanism in place to effectively phase out NSP. To make co-management sustainable with sufficient trust among all parties, its institutional structure needs nurturing for a few more years with (1) adequate material and technical support; (2) a well-defined and equitable sharing of responsibilities; (3) the further devolution of power from the FD to the Committee; (4) a strong commitment by the FD to provide adequate space and support for Nishorgo institutions to flourish; and (5) the realization of all promises delivered to its stakeholders;

UNESCAP (2007) notes that good governance is an ideal that very few countries or societies have come close to achieving. However, to ensure sustainable development and conservation, actions must be taken towards achieving this ideal with assistance from various development partners. The Bangladesh FD has demonstrated commendable success in its mangrove reforestation program in coastal areas, and in its social forestry program in degraded reserve forests and marginal lands. In line with these successes, the FD's commitment to promoting co-management in the country's PAs has great potential to empower members of local communities to share in the responsibility and promise of conserving biodiversity.

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The Role of Women in Co-Management at Lawachara National Park

Shamima Begum Shewli[1]

Abstract

Collaborative management (co-management) is gaining recognition worldwide as a viable framework for participatory conservation planning that adheres to the needs and norms of local stakeholders. In Bangladesh, the government has embraced co-management through the Nishorgo Support Project, a partnership between the Forest Department and USAID. The co-management institutional structure includes a Co-management Council and a Co-management Committee, as well as more grassroots-level bodies, such as patrol groups and forest user groups. There are both men's and women's forest user groups comprised of members from numerous households within a single village or community. While women's forest user groups are a step in the right direction, they have not proven sufficient to gain the awareness and support of women on a broad scale. This paper draws on research conducted among three women's forest user groups surrounding Lawachara National Park. It reveals the low level and superficial nature of their awareness about, and involvement in, various co-management activities and decision-making forums; from training in alternative income-generating activities, to participation and holding of official positions in their forest user groups or the Co-management Committee. Findings suggest that increased involvement of women in a broad range of co-management activities is not only beneficial for their own socioeconomic well-being, but also imperative for sustaining the livelihoods of their communities, and for preserving the forests and biodiversity on which these communities depend.

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Introduction

Environmentalists and national conservation authorities worldwide have begun to emphasize the importance of local participation in decision-making for the management of protected areas (PAs) (Agrawal and Gibson 1999). Svarstad *et al.* (2006) argue that the involvement of local actors brings in local knowledge, which leads to better decision-making, planning and management for sustainable resource use. Brasell-Jones (1998) demonstrated that the involvement of women in natural resources management is crucial if there is to be balanced decision making. Women and men have different needs and priorities, as well as different perspectives and specialized skills. Therefore, adequate representation of the views of both men and women is crucial to realizing management decisions that incorporate the full range of local experiences and livelihood requirements. Moreover, the question of women's rights is viewed as a question of human rights, as they represent half of humanity. When the role of women is incorrectly assumed or overlooked, the achievement of development objectives can be adversely affected. Therefore, to ensure effective, inclusive policy development, women's needs and interests must be identified and addressed as a part of everyday planning practice (Little 1994). Furthermore, involvement of women in co-management, through skill-based and need-based development training, can help to alleviate forest dependence. Co-management efforts will succeed in this regard only when all local stakeholders perceive the value of conserving PAs.

Bangladesh has experienced significant loss of its natural resources over the last few decades. This can be attributed to the fact that the Forest Department (FD) – the only agency with the legal authority to manage forest resources – has failed to enlist the cooperation of local residents. As a result, there is a perceived need to develop a model for the involvement of local people in the management of PAs. To this end, five pilot sites were selected in 2004, under the Nishorgo Support Project (NSP), a collaborative co-management project implemented by the United States Agency for International Development (USAID) and the Government of Bangladesh (GOB).

Since NSP has been implementing this co-management approach for a few years now, it is an appropriate time to evaluate the experience and impacts of NSP activities with respect to women's participation. This paper assesses the extent and

quality of women's involvement in forest management activities and decision-making in Lawachara National Park (LNP). I based my research on the premise that local women should have an understanding of both the current co-management approach and the potential future impacts of the project on their livelihoods. I seek to influence policy-makers and site managers in order to increase the involvement of women in NSP activities, and thereby enhance conservation efforts and the quality of livelihoods for all people in LNP.

Background

I conducted my research at LNP, located within the West Bhanugach Reserve Forest in Kamalgonj Upazila, Moulavibazar District. LNP was created in 1996 according to the Wildlife (Preservation) (Amendment) Act of 1974. The park is now developing from a plantation forest to an ecological structure resembling a natural forest rich in floral and faunal diversity. It covers an area of 1,250 hectares, and there is a plan to extend this area to include 281 additional hectares of reserve forest. The topography is undulating, with slopes and hillocks (*tila*) ranging from 10m to 50m in elevation. LNP lies between the Dholai River on the east, the Manu River on the north, and the road from Moulavibazar to Srimongal on the west. A number of sandy-bedded streams and creeks (*nallahs*) pass through the park, so aquatic habitats associated with forest cover, riparian vegetation and animal species are an important part of the park's overall ecological composition. The park also forms the catchment area of a number of small streams. Most of the northeastern boundary of the park and the proposed extension, are bordered by FD lands under Kalachara Beat (NSP 2006).

The park is also surrounded by a number of villages, towns, and cultivated fields, as well as four tea estates situated along the western border. LNP provides a number of important ecosystem services to both its non-human inhabitants and the surrounding human population, and performs a critical role in the conservation of biodiversity. A number of communities, including several ethnic minority groups, reside within and around the park and directly depend on it for ecological services and livelihood maintenance. There are approximately 18 villages in all, of which two, Lawachara and Magurchara, are located inside the park. The villagers of both

Lawachara (23 households) and Magurchara (40 households) are members of the Khasia ethnic group and grow betel leaf vines in forested areas earmarked for them by the FD. In exchange, they supply labor for forest protection and planting activities. They meet their subsistence consumption needs for fuelwood and derive timber for construction from these forests. There is also a Tripura ethnic minority settlement with 75 households located at the southwestern boundary of the park. The rest of the villages are located at the northeastern boundary and are inhabited by migrants from Comilla, Noakhali and the neighboring Indian states of Tripura and Assam. In the 18 villages, there are 2,255 households, including 138 tribal households (NSP 2004).

According to NSP site reports (NSP 2004), about 65% of the local people are poor or very poor – and earn their livelihoods as day laborers or fuelwood collectors. Of the remainder, 5% are rich and 30% are middle class. In contrast, among the tribal people, roughly 97% are poor or very poor, with the highest concentrations of poor found in Lawachara Punji (98%), Magurchara Punji (96%) and Dolubari (95%), followed by Baghmara (58%) (NSP 2004). Fifteen percent of the local population is unemployed. The primary occupations of the Khasia tribal people are betel leaf cultivation and various types of wage labor. People from the Tripura community rely mainly on pineapple and lemon cultivation, as well as wage labor. The major occupations of Bengalis include agriculture (65-70%), fuelwood collection (30%), wage labor (10-15%), and small business (3-5%) (NSP 2004). There are also many non-governmental organizations (NGOs) operating and providing microcredit in the area, including Bangladesh Rural Advancement Committee (BRAC), Association for Social Advancement (ASA), Health, Education and Economic Development (HEED) Bangladesh, Grameen Bank, and Bangladesh Rural Development Board (BRDB). NSP works in the area through a local NGO named Rangpur Dinajpur Rural Service (RDRS). Many government departments and services also operate in the area, such as the Thana Health Complex, the Thana Agriculture Office, the Thana Livestock Hospital, the Thana Fisheries Office, the Thana Social Welfare Office, Janata Bank, Sonali Bank, Agricultural Bank, and Agrani Bank.

Resource managers in the FD now consider the support, cooperation, and participation of the local population to be imperative for the protection and conservation of forests and biodiversity. NSP is trying to establish a partnership between people

from the local communities and the FD through collaborative management (co-management), in order to share responsibility and decision-making related to management of forests and bio-diversity conservation. Co-management also requires community empowerment. NSP is trying to make people understand the short-term and long-term environmental impacts of overexploiting forest resources by undertaking various awareness-building and social mobilization interventions.

Through its partner NGO, RDRS, NSP has formed a total of 53 forest user groups (FUGs) in 16 of the villages surrounding LNP. Among these groups, there are 21 male FUGs (where all members are male) and 32 female FUGs (where all members are female). The main objectives of these FUGs are to reduce forest dependence and to improve the financial situation among poor people living within 5 km of the forest. This is accomplished by providing training in various alternative income-generating activities (AIGAs), and through educational, awareness-raising programs addressing forest protection, future benefits from forests, health, education, and other topics of interest to members. FUG members are selected according to the following criteria: Men and women are both eligible, as long as they are between 18 and 50 years old, somewhat dependent on the forest, financially insolvent, and own less than 30 decimals of land, including their homesteads. FUG members should also have basic literacy skills, but not beyond the secondary school level. These criteria are set because NSP aims to work with the poor and disadvantaged, who do not have the skills and resources to gain good external employment on their own. They must also be permanent residents of their villages, and no more than one member, male or female, is permitted from each household.

According to Merchant (1995) and Steel (1996), women are more concerned about environmental issues and more likely to join environmental groups compared with men. Therefore, local women should be included in the current co-management approach and efforts should be made to teach them about potential impacts of the project on their livelihoods and decision-making.

Methods

The general goal of this study was to investigate the role of women in co-management under NSP in several villages near LNP. My specific objectives include:

1. Evaluating participation of women in NSP co-management activities and identifying indicators of women's empowerment through co-management;
2. Understanding the impact of co-management on women's income and livelihoods;
3. Assessing women's awareness of co-management activities that support forest resources and bio-diversity.

I chose two neighboring villages (Longurpar and Ballarpar) near LNP as the research sites for my study, with the basic aim of understanding the extent of women's involvement in NSP co-management activities. My main criteria for selecting these villages were: (1) co-management by NSP was active, (2) they were easily accessible, and (3) female FUGs were present. With a checklist and a draft questionnaire, I completed a pilot survey in LNP and the two selected villages in February 2007. At this time, I informed villagers about the purpose of the survey. Then, based on the information from the pilot study, I finalized the semi-structured questionnaire for the field survey. I collected primary information between February and June 2007. The final survey and two focus group discussions were completed with the participation of female FUG members (who were either directly or indirectly involved in co-management activities), and with a control group of women who did not belong to an FUG. A total of four focus group discussions were completed, of which two were in Ballarpar village and two were in Longurpar village. I also interviewed four people from each community with a high level of knowledge as key informants – including formal leaders, local elites, and local officials – all of whom were male. In addition, I gathered information about the historical background of the area, local communities, current forest conditions, local people's reliance on forests, and local involvement in NSP co-management activities.

The two villages selected for the study, Ballarpar and Longurpar, are located about 4 km and 3 km from LNP, respectively. The majority of people in these villages are Muslim, and they are directly dependent on the forest for their livelihoods. They

cut trees illegally – individually, in small groups, or by hiring gangs from outside. Women and children often collect smaller trees for firewood. NSP has formed two female FUGs in Ballarpar, and one in Longurpar. Both the *Ballarpar Shapla Mohila Dol* (Ballarpar Shapla Women's Group), with 16 members, and the *Ballarpar Shefali Mohila Dol* (Ballarpar Shefali Women's Group), with 11 members, were formed in 2005. The *Longurpar Doridro Mohila Dol* (Longurpar Poor Women's Group), with 12 members, was also formed in 2005. The women of these groups share many of the same livelihood attributes and strategies. Every group consists of a president, a vice-president, a secretary, and a treasurer. The group members select these leaders from among themselves.

For the focus group discussions, I selected a random sample of 24 informants from the two villages. In Longurpar village, I randomly selected 12 women out of 92 households. Of these women, eight were FUG members and four were not members. In Ballarpar village, I randomly selected 12 women out of 61 households, including nine FUG members and three non-members. I conducted two focus group discussions in each village, meeting separately with the FUG members and non-members. I also collected information on a variety of demographic and socioeconomic indicators: household composition, age, education, primary and secondary occupations, interactions with the forest, alternative sources of fuelwood, awareness of co-management and other NSP activities, sense of belonging to the FUG, constraints in attending meetings, roles in biodiversity and forest conservation, preferred AIGAs, NSP training experience, and expected benefits from NSP.

Results and discussion

Both villages in this study are located at about the same distance from LNP. I observed that the people of the two villages were very poor. Their livelihoods, basic socioeconomic indicators, education levels and other demographic indicators were very similar, according to the household profiles and the village profiles obtained from reports of NSP and the FD. Therefore, I considered both groups of women as one set in my analysis. This is justified because my study is focused on the needs and interests of all women living in villages around LNP, rather than on differences among them.

Women at home and at work

I identified literacy levels of the respondents from both villages. Among the 24 women I interviewed, 38% were illiterate, 54% were educated at the Grade 5 level or below, four percent were educated up to Grade 7, four percent attended school through Grade 10, and nobody had completed higher education. Most of the women (about 71%) were engaged only in household activities. Approximately 21% of the women were engaged in both household maintenance and income-generating activities (i.e., poultry rearing, vegetable cultivation, sewing), while only 8% were involved in household and co-management-related income-generating activities.

According to the villagers, agriculture was the main source of income for most households, while day labor (both agricultural and non-agricultural wage work, e.g. in brickworks or sawmills) and services were the next most important (Table 1). Secondary sources of household income include agriculture, poultry rearing and trade. I found that about a sixth of the households had only one source of income, and thus no secondary income source (Table 1).

Table 1: Primary and secondary sources of income for respondents' households

Source	Primary Income Sources		Secondary income sources	
	Number of households	Percentage of households	Number of households	Percentage of households
Subsistence agriculture	9	38%	8	33%
Wage labor	7	29%	1	4%
Agriculture and labor*	3	13%	--	--
Vegetable cultivation	--	--	1	4%
Poultry rearing	--	--	5	21%
Cattle rearing	--	--	1	4%
Service	5	21%	--	--
Business and small trade	0	0%	4	17%
Forest Resources	0	0%	--	--
No secondary income	--	--	4	17%
Totals	24	100%	24	100%

*Note: "Agriculture and labor" indicates that the household splits its time evenly between agricultural and non-agricultural work on an annual basis.

The study further revealed that only 11 women out of the 24 interviewed earned some money through wages, while more than half of the women did not earn money independently of their husbands and families. Among those women who did earn money, the majority of them earned it from poultry rearing, with vegetable cultivation and cattle rearing forming the next most important activities (Figure 1).

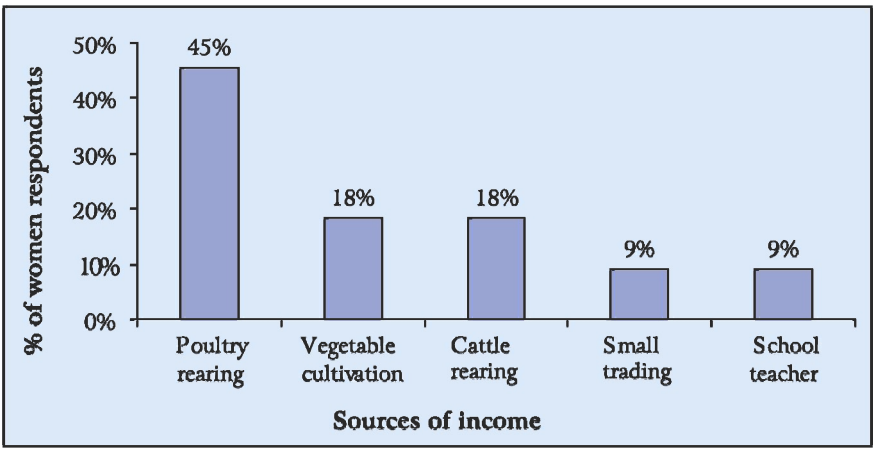

Figure 1: Main income sources for female respondents who earn wages (n=11)

Women in the forest

When I asked the women about the roles of men and women in collecting fuelwood, they responded that women and men were the primary collectors of fuelwood in an almost equal number of households (Figure 2), and that both men and women were the primary fuelwood collectors in two of the households. Only one respondent said that nobody in her family collected fuelwood from the forest. I also found that most of the households used tree leaves, paddy straw, bamboo, cow dung, paddy husk, and paddy roots as alternative sources of fuel.

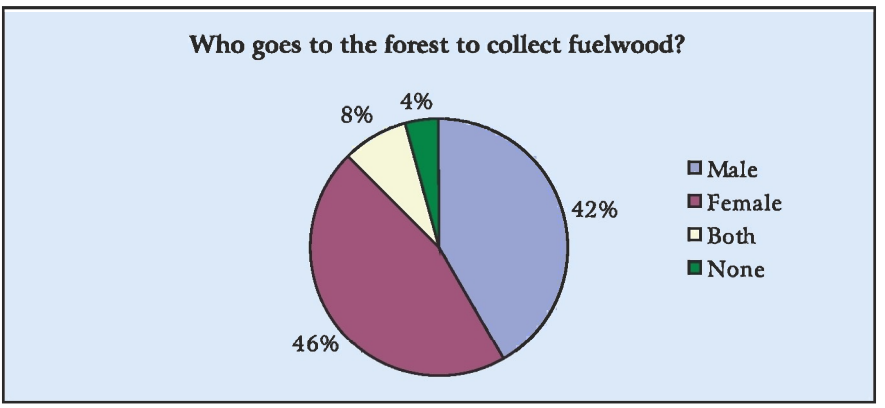

Figure 2: Primary household fuelwood collector by gender (n=24)

Women and co-management

In my sample design, I randomly selected 24 women, including both those who are members of NSP-supported female FUGs (71% or 17 women) and women who do not belong to these groups (29% or 7 women) (Table 2). None of the 24 women were members of the Co-management Council or the Co-management Committee. My results also reveal that 58% of the respondents' husbands did not belong to a FUG, while 38% of their husbands did (despite rules dictating that no more than one member from each household may join a FUG). Furthermore, four percent of the women's husbands were members of the local Co-management Committee, and none of the women or their husbands belonged to the Co-management Council. Table 2 shows the FUG membership status of the women interviewed. I also asked whether the women received encouragement from their husbands to attend co-management meetings and found that 63% of respondents' husbands did not encourage them to attend meetings, while 37% did.

Table 2: FUG membership status of women respondents

Status	Number of respondents	Percentage or respondents
President	1	4%
Secretary	4	17%
Member	12	50%
Non-Member	7	29%
TOTAL	24	100%

In addition, I asked those respondents who said they do participate in the FUG meetings about how they participate (Table 3). Four of these respondents said they were passive participants who attended but remained silent; six of the women said they spoke up and gave their opinions; six claimed they took on meeting-related responsibilities (including organizing of the meeting and agenda, invitation of participants and facilitating discussions); and one reported that she raised questions in the meetings. Overall, more than half of all respondents said they were active participants in female FUG meetings and only four out of the 17 women who were FUG members admitted they were passive participants. Therefore, it appears that many women FUG members exhibit a high level of interest in their user group and actively participate. However, I also found that none of the FUG members that I interviewed had ever attended any meetings of the Co-Management Council or the

Co-Management Committee. Moreover, there is no designated post for the representation of female forest users within the Council or the Committee. Consequently, the needs and concerns of female FUG members do not reach the upper-level management institutions where important decisions are typically made.

Table 3: How women participate in forest user group meetings

Role (lowest to highest participation level)	Number of respondents	Percentage of respondents
Not a member	7	29%
Attend and remain quiet	4	17%
Give opinions	6	25%
Take on meeting responsibilities	6	25%
Raise questions	1	4%
Total	24	100%

My results suggest that almost all of the women face problems in attending FUG meetings and training programs arranged by NSP, although they reported that they are interested in joining these activities. Through interviews with respondents (women) and key informants (men), I tried to identify both women's and men's constraints in participating in such activities. I found that the main constraints faced by women were household work, childcare, duties for their husbands, and social attitudes, in that order. On the other hand, the main problems that men faced were loss in business/income, time limitations, household work, and agricultural work (Table 4).

Table 4: Constraints faced by women and men in attending NSP meetings

Constraints	Women		Men	
	Number	Percentage*	Number	Percentage*
Household work	22	92%	12	50%
Childcare	16	67%	0	0%
Duties for husband	11	46%	--	--
Loss in business and/or income	1	4%	17	71%
Time limitations	1	4%	13	54%
Agricultural work	0	0%	11	46%
Social attitudes	6	25%	0	0%
No constraints	2	8%	2	8%

*Note: Due to multiple responses, percentages do not add up to 100%.

Generally, awareness about NSP-related activities was quite low. I found that just under half of the women knew that NSP promotes forest protection; a third of the women knew that NSP organized meetings; and less than one third of the women were aware of any NSP training programs. I also found that none of the seven women who did not belong to a FUG were aware of NSP activities, and only one FUG member was aware of all of NSP activities (Table 5).

Table 5: Respondents' awareness of major NSP-related activities

Activities named by respondents as NSP work	Number of respondents	Percentage of respondents*
Forest protection	11	46%
Organized meetings	8	33%
Organized trainings	7	29%
Tree plantings	4	17%
All of these	1	4%
Did not know (not a FUG member)	7	29%

*Note: Due to multiple responses, percentages do not add up to 100%.

NSP is undertaking various awareness-raising and social mobilization interventions by forming men's and women's forest users groups (FUGs) and patrolling groups to help people understand the short-term and long-term environmental impacts of poor forest management. Table 6 shows that, among respondents of this study, most women discouraged both their neighbors and their husbands from degrading the forest. About a third would encourage their neighboring villagers and women who were not members of the group to conserve the forest. In addition, one woman motivated her brothers, and another motivated her other group members, not to degrade the forest. However, despite their efforts to encourage conservation among their friends and relatives, just under half of the women admitted to degrading the forest themselves.

Table 6: Role of women in motivating others to conserve forests

Women's motivational activities	Number of respondents	Percentage of respondents*
Motivate neighbors	21	88%
Motivate husband	19	79%
Do not use forest resources themselves	10	42%
Motivate neighboring villagers	8	33%
Motivate other women	7	29%
Motivate children	2	8%
Motivate brother	1	4%
Motivate other group members	1	4%

*Note: Due to multiple responses, percentages do not add up to 100%.

Approximately 46% of the women interviewed believe that women play a larger role than men in forest conservation, while 38% believe that men played a larger role than women, and 13% believe that men and women play equal roles. I also tried to find out why women were interested in joining FUGs. I found that nearly all of the women were interested because they thought the FUG could help them to earn and save money. However, many were also interested in preserving biodiversity (75%) and protecting the forest (38%), and some (21%) wanted to be in the group because they thought it would help them to organize a women's collective (Table 7).

Table 7: Reasons why women are interested in joining FUGs

Reasons	Number of respondents	Percentage of respondents*
Save money	21	88%
Preserve biodiversity	18	75%
Protect forest	9	38%
Organize themselves (women's collective)	5	21%
Source of alternative income	3	13%
Ensure progress of their family	3	13%
Save animals	2	8%
Social prestige	1	4%

*Note: Due to multiple responses, percentages do not add up to 100%.

I also found that a majority of respondents (54%) did not receive any training in AIGA from NSP. However, the remaining women (46%) were able to avail of different types of training. I tried to identify whether the training from NSP was able to meet their needs and interests by asking what kinds of training each respondent wanted, and what training she had actually received. I found that there was a considerable gap between their interests and the training received, especially for the three most popular AIGAs. Most of the women (92%) were interested in receiving training in poultry rearing, but only 8% of all women got such training from NSP. Similarly, 92% were interested in vegetable cultivation training, but only 25% got this training from NSP. Finally, approximately 63% of the women were interested in cattle rearing training, but only 4% received any NSP training for it. Therefore, women's needs and interests were not adequately reflected in NSP training activities (Table 8) as the amount of AIGA training provided by NSP was insufficient to meet local demands. NSP should increase the number of AIGA training sessions on

poultry rearing, vegetable cultivation, cattle rearing, sewing or tailoring work, fish cultivation, nursery raising, preparation of puffed rice, small businesses, handicrafts, and bamboo-cane products, according to the expectation of local leaders and community members.

Table 8: Differences in training interests and training received by female FUG members

Activities	Training topics of interest		Training received from NSP		
	Number of respondent	% of all respondent*	Number of respondents	% of all respondents	% of trained respondents
Poultry rearing	22	92%	2	8%	18%
Vegetable	22	92%	6	25%	55%
Cattle rearing	15	63%	1	4%	9%
Sewing /tailoring	6	25%	0	0%	0%
Fish cultivation	6	25%	0	0%	0%
Raising nursery	5	21%	2	8%	18%
Puffed rice	3	13%	0	0%	0%
Small business	3	13%	0	0%	0%
TOTALS			11	45%	100%

*Note: Due to multiple responses, percentages do not add up to 100%.

Conclusion

Without active involvement of women in co-management activities, NSP cannot achieve its goals of promoting conservation and improved livelihoods. In my assessment of women's awareness of co-management activities supporting the conservation of forest resources and biodiversity, I found that there is a general lack of knowledge about NSP activities among the women of both study villages. On the other hand, the results also reveal that women can play a significant role in forest conservation by motivating or influencing others to reduce their use of forest resources.

Two primary aims of this study were to evaluate the participation of women in NSP co-management initiatives and to identify the indicators of women's empowerment through co-management. My main finding was that, although a large number of women are participating in the women's group meetings and availing of the training provided by NSP, in many cases these women did not receive training according to

their needs and priorities. This is partly because women's group members are not actively represented in the Co-management Council or Committee meetings, so these needs and interests are not reflected properly at higher levels. I also found that women face many constraints in attending group meetings and NSP training programs. The research shows that some women lack confidence in voicing their opinions because they believe their views and opinions might be ignored. All of these factors contribute to a communication gap between the members of forest user groups and the decision-making forums of the Co-Management Council and Co-Management Committee. Such a gap jeopardizes all NSP efforts to provide effective AIGA support to local stakeholders, especially women.

In terms of the impact of co-management on women's income and livelihoods, I found that most of the women living in Ballarpar and Longurpar villages are very poor and have many expectations from NSP. For instance, women expect to receive useful and need-based training. They hope that AIGAs will improve their livelihoods and reduce their dependency on the forest. According to the study, women also hope that NSP activities will help them to increase their savings and their decision-making powers within their own households. I found that the amount of AIGA training provided by NSP was insufficient to meet local demand and, for the most part, did not match local needs and priorities. This inconsistency must be addressed.

In summary, this study reveals that for NSP to be effective in reducing women's dependence on forest resources – by promoting their empowerment and enhancing their income-earning opportunities – it is crucial that women become active participants in important decisions that affect their livelihoods and well-being. In other words, women must be more involved in both the Co-Management Council and the Co-Management Committee at LNP. Unless and until this happens, the process of co-management will be constrained and unable to realize its dual aims of promoting biodiversity conservation and enhancing local livelihoods.

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Impacts of Co-Management Activities on Women Members of Forest User Groups in Satchari National Park

Rizwana Subhani[1]

Abstract

The Nishorgo Support Project (NSP) plays a crucial role in supporting the livelihoods of people living in and around five protected areas (PAs) in Bangladesh. This research explores the involvement of women members in forest user groups (FUGs) at one of these sites, Satchari National Park, and examines the impact of participation in co-management on their livelihoods. I interviewed 40 female FUG members and 20 female non-FUG members to assess their degree of access to income-generating opportunities, their socio-economic empowerment, and their physical and material well-being. My results suggest that participation in FUGs has increased over the past year, and that 65% of respondents show an interest in joining future NSP activities through FUGs. The field survey revealed that 59% of women who belong to the FUGs received both training and funding for alternative income generating activities (AIGAs), and that 41% of the women who were trained successfully developed their own enterprises. On the other hand, only about 7% of non-FUG members, who did not receive training in income generating activities from NSP, report earning income from these types of activities, including cow fattening, nursery development, poultry rearing and fish production. Participation in FUGs not only enhances the livelihoods of women living in close proximity to Satchari National Park, but some women felt that it also increased their respect in the eyes of their family and society. These positive impacts on livelihoods and socioeconomic status encourage women living around Satchari National Park to become more involved in FUGs, and thereby contribute to forest protection.

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Introduction

Co-management:

'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)

Collaborative management (co-management) of protected areas is a participatory approach to environmental conservation that seeks to enhance both natural resource conservation and local livelihoods. This approach gives local residents both the responsibility to manage their natural resources effectively and the opportunity to enjoy the benefits derived from them. Without the active involvement of local people, there is little chance for reducing their dependence on forests and guaranteeing the success of PA initiatives. A great number of environmentalists, non-governmental organizations and national governments worldwide have begun to emphasize the importance of local people's participation in decision-making and management of PAs (Svarstad *et al.* 2006, as cited in Agrawal and Gibson 1999; Hulme and Murphree 2001; Ghate 2003).

Bangladesh has faced significant losses in natural resources and biodiversity over the last few decades. A major reason for this environmental degradation is that many people have been left out of the conservation process. Not surprisingly, these people have decided not to cooperate with conservation efforts that they perceive could adversely affect their own livelihoods. To address this issue, and to engage local stakeholders as partners in the management of PAs, the Forest Department has initiated a nationwide co-management initiative called the Nishorgo Support Project (NSP). NSP has been working in five protected area pilot sites since 2004 to involve local stakeholders that are directly or indirectly dependent on forest resources in activities to improve their livelihoods. The primary goal of NSP is to promote the conservation of biodiversity within the protected areas of Bangladesh. In addition, one of the project's five key objectives is to "strengthen the local economy and to better the living standard of local stakeholders" (NSP 2007).

In Bangladesh, women have rarely been part of local participation initiatives; yet it is quite impossible for such initiatives to achieve success without them. Shiva (1989, as cited in Svarstad *et al.* 2006) argues that women always act in a way that is more environmentally friendly than men. Thus, policy-makers and PA managers should identify and address women's needs and interests in PA management in order to ensure effective conservation policy (Little 1994 as cited in Brasell-Jones 1998). Skill-development training and participation in co-management activities helps women to alleviate their reliance on forests. NSP's conservation efforts will succeed only when women who depend on forests perceive more value in conserving protected areas than in exploiting them.

NSP has identified local stakeholders, and formed forest user groups (FUGs), in order to provide them with opportunities for alternative income generating activities (AIGAs) and simultaneously promote forest protection. This study examines how the involvement of women in these local forest management institutions improves their livelihoods by enhancing their participation, their income-generating potential, their socio-economic empowerment, and their physical and material well-being. The goal of this study is to influence policy-makers and site managers to increase the involvement of women in NSP activities and thereby enhance the quality of livelihoods for all people living in and around Satchari National Park.

Background

Satchari National Park, the newest of 17 PAs in Bangladesh, was established in 2005 to preserve the remaining natural hill forest patch of Raghunandan Hill Reserve Forest. *Satchari* means "seven streams," referring to the water channels that flow through the forest and form important catchments. Ecologically and botanically, the tropical evergreen and semi-evergreen forest of Satchari represents a transition zone between the regions of the Indian subcontinent and mainland Southeast Asia. This forest and its biodiversity are now highly degraded. As a result, a number of animal species have already become locally extinct, while several more are on the verge of disappearing, and an even greater number are variously threatened.

The park is located in Chunarughat Upazilla (the smallest local administrative unit) of Habiganj district, nearly 130 km northeast of Dhaka and about 60 km

southwest of Srimongal. Satchari National Park covers an area of about 243 hectares and is governed by the regulations of the Forest Act 1927 (Mollah *et al.* 2004). The park is surrounded by a number of tea estates, villages, towns, and cultivated fields. Nine tea estates are located close to the park. Only one forest village, Tiprapara, inhabited by 24 households of the Tripura ethnic group, is located inside the park. The other settlements that have stakes in the reserve are located in 14 surrounding villages, situated from 3 to 8 km away from the reserve. The people from these villages, as well as the tea estate laborers, depend on forest resources to varying degrees (NSP 2004).

Satchari National Park directly supports the local population by providing fuelwood, fodder, house-building materials, and timber as well as non-timber forest products like bamboo, cane, honey, sungrass, medicinal plants, vegetables and sand. Some people are directly dependent on these resources for their basic subsistence, or to earn extra income. Others are not directly involved with resource extraction, but are variously linked to forest resources through processing, trade and other forms of utilization.

Stakeholders

Stakeholders are defined as those who have rights or interests in a system. They include individuals, communities, social groups, governments or organizations that affect, or are affected by conservation efforts and goals. Local people, indigenous communities, and other stakeholders depend on forest resources for their livelihood and cultural survival (Rao *et al.* 2003). NSP recognizes three categories of stakeholders at Satchari National Park: primary, secondary, and institutional (Mayer 2005). Primary stakeholders are directly involved in the extraction of resources from the forest, or otherwise directly affect the forest. Secondary stakeholders have an indirect impact on the forest through trading or other means. Institutional stakeholders are involved in various development activities and the administration of adjoining areas.

Forest user groups

FUGs are comprised of groups of stakeholders identified by NSP that are directly or indirectly dependent on the forest, and thus consist of both primary and secondary stakeholders. At Satchari National Park, 20 FUGs are involved in NSP

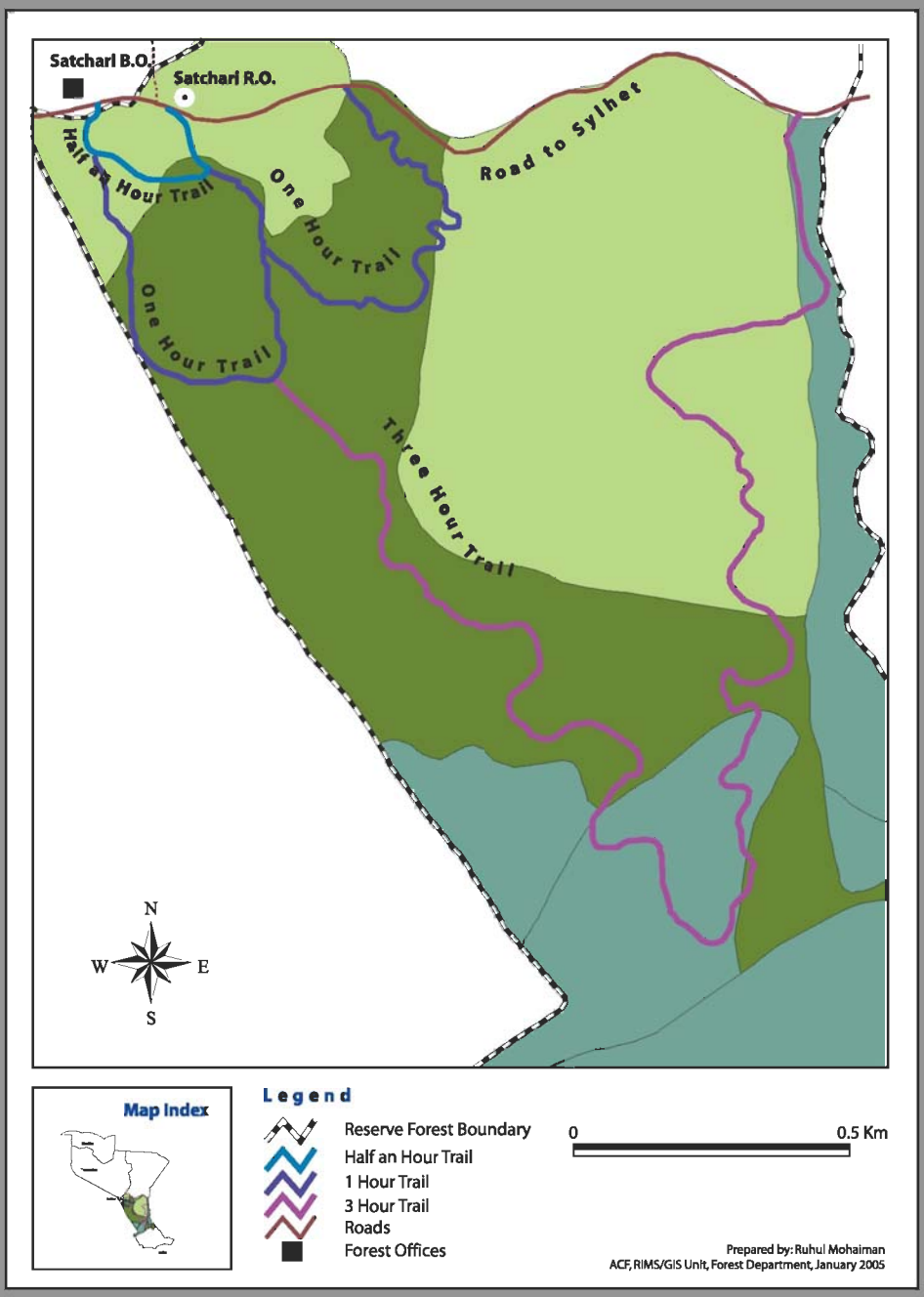

Figure 1: Map of Satchari National Park

activities, representing 273 households. Among these are 16 female FUGs and 4 male FUGs (NSP 2004). These local institutions seek to reduce dependence on the forest and to improve the quality of life of their members through the provision of training and AIGAs. According to the NSP site facilitator at Satchari National Park, Mr. Joy Dip Roy (personal communication, February 2007), FUGs seek to:

1. Reduce dependence on forest resources by increasing the use of alternative income sources.
2. Reduce fuelwood collection in the PA by developing alternative fuel plantations in the surrounding landscape.
3. Use alternative fuel stoves, and raise awareness of these alternatives among non-members.
4. Support co-management activities for managing the PA.
5. Support eco-tourism development in the park.
6. Generate savings for members' economic development and investment in alternative income-generating strategies.
7. Build awareness among the local population and surrounding community members about the importance of forest conservation.

Box 1: Successful activities of forest user groups

1. Participation in 60-70% of decisions regarding PA management.
2. Involvement in different types of awareness-raising programs such as people's theater and folk songs on biodiversity conservation.
3. Participation in local trainings on alternative stove making, production of alternative fuelwood trees, and landscape-development programs such as stair construction for the Satchari Tiprapara footpath.
4. Implementation of a program for planting trees along the Union Parishad road.

NSP has worked at Satchari National Park since 2004. To implement its co-management activities, NSP involves local people through the formation of FUGs.

To form a FUG, interested groups of stakeholders within a community first discuss their interest in forming a group with the NSP field organizer or with the Co-management Council members. Then, members conduct a survey among the community members to gauge their degree and nature of forest dependence, as well as their level of poverty. If the stakeholders fulfill the requirements, the Co-management Council gives them permission to form a FUG. Then the members select a chairperson, vice-chairperson, secretary and treasurer from among themselves. They organize meetings twice a month and NSP staff members or Co-management Council members follow the group's activities, helping them grow stronger. Box 1 above lists some successful activities of FUGs, and Box 2 below describes the types of AIGA training that FUG members have received.

Box 2: Types of training provided to forest user group members

1. Cow fattening and milk-cow raising
2. Poultry rearing
3. Plant nursery development
4. Fish raising
5. Eco-tour guiding
6. Home/vegetable gardening
7. Pig rearing
8. Eco-rickshaw service
9. Weaving
10. People's theater and folk songs

Research objectives and methods

This study seeks to analyze the impact of co-management on the livelihoods of female FUG members in Satchari National Park. It examines how involvement of women in FUGs improves their livelihoods by enhancing their participation, their income-generating opportunities, their socio-economic empowerment, and their physical and material well-being. Considering all of these aspects, the specific objective of the study is to analyze the overall impact of participation in NSP-supported co-management activities on the livelihoods of female FUG members living in and around Satchari National Park.

I employed both primary and secondary data in my research. I collected primary data through personal interviews, using structured and semi-structured

questionnaires. I gathered secondary data by consulting relevant published and unpublished documents, participatory rural appraisal (PRA) reports, and the NSP site information brochure for Satchari National Park (NSP 2006). I also conducted focus group discussions and community mapping exercises.

NSP has formed 16 female FUGs in Satchari National Park in order to link women's livelihoods with forest conservation. I conducted my survey research among four of these female FUGs in two villages (two FUGs in each), Ratanpur and Baghbari, in Sajahanpur Union, from mid-February to late April 2007. The target working areas were selected through discussions with park officials, NSP staff members, staff members of the local coordinating NGO Rangpur Dinajpur Rural Service (RDRS), and the Co-management Committee for Satchari National Park. The four female FUGs selected from these two villages were Ratanpur Golap Mahila Dal, Ratanpur Shapla Mahila Dal, Uttar Baghbari Shapla Mahila Dal (No. 1), and Baghbari Meghna Mahila Dal (No. 2). During the survey, I randomly selected 10 members from each of the 4 FUGs for interviews (40 women total). I also randomly selected and interviewed 10 women who do not belong to a FUG from each village (20 total). Thus, I interviewed 60 women in all, 30 from each village. The interviews lasted 30-60 minutes for each participant.

Results and discussion

In this section, I will focus on four important elements of the livelihoods of female FUG members: (1) participation in NSP through FUGs; (2) employment and income-generating activities; (3) socio-economic empowerment; and (4) household physical and material well-being.

Participation in FUGs

Participation refers to involvement of local people in the design, implementation, and evaluation of a project (Brown and Wyckoff-Baird 1992). My findings reveal that women's participation in FUGs has been increasing over the past year. Out of the 40 FUG members interviewed, 14 joined in 2005 and 25 joined during 2006. This change has occurred partly because NSP encouraged people living in and near Satchari National Park to take part in various management and AIGAs. Approximately 65% of the non-members that I interviewed also expressed a desire to join

a FUG. According to my analysis, 87% of the women who joined FUGs and NSP activities did so through the influence of other FUGs members. After joining the FUGs, many women changed their lives by obtaining new sources of income and earning/saving more money than before. This, in turn, influenced other villagers to join. However, 55% of current non-members said they have not joined because they lack knowledge about NSP activities, and the remaining 45% reported that they were not interested in participating in NSP's income generating activities. Among the FUG members, 90% said they would encourage other people to participate in NSP-sponsored income-generating activities, while the remaining 10% said they would not try to influence others because they did not receive any benefits in the form of training or funding. It is noteworthy that such a large percentage of members feel the importance of encouraging non-participants to improve their livelihoods through NSP-supported income-generating activities.

Approximately 60% of members said they attend FUG meetings twice a month. These people generally feel that NSP represents a beneficial, ongoing project at Satchari National Park. In terms of participation in decision-making, approximately 50% of FUG members claim that their leaders make decisions affecting the group without asking for their input, while the other 50% felt that they have substantial influence in both decisions and final outcomes. Based on my own observations during the research, it is evident that group leaders have considerable influence in FUG decisions. In order to enhance female participation in co-management, it is essential that female stakeholders are able to communicate their concerns to NSP, and that NSP is aware of and able to respond to these concerns. For this to happen, women must participate more fully in decision-making processes of the FUGs and the Co-Management Committee.

Employment and income generation

Twenty one percent of FUG members and seven percent of non-members interviewed reported earning income from various AIGAs such as cow fattening, plant nursery development, poultry rearing and fish farming (all activities for which NSP provides training). Other respondents, both FUG members and non-members, are engaged in various other income-generating activities (Table 1).

Table 1: Income-generating activities of FUG members and non-members

Category	Members (% of respondents*)	Non-members (% of respondents*)
NSP-supported activities such as cow fattening, poultry raising, plant nurseries, fish culture	21%	7%
Agriculture	24%	19%
Fuelwood collection	4%	22%
Business (e.g., shop or tea stall)	23%	30%
Factory or office work	23%	22%
Services and crafts (e.g., rick shaw/van driver, weaving)	5%	7%

*NOTE: Due to multiple responses, percentages do not necessarily add up to 100%.

Forests have traditionally played an important role as a source of income and a basis for the livelihoods of local communities. One of NSP's six components is to "offer alternative income-generating opportunities to those presently living off of the sale of forest resources". Such activities help protect the forest. After participation in NSP, most FUG households have left the fuelwood collection profession and only 4% remain involved in this activity, whereas 22% of non-members are currently engaged in fuelwood collection. This suggests that NSP may have influenced FUG members to give up illegal fuelwood collection in favor of other options.

Table 2: Gross monthly income of respondents' households (in Bangladeshi Taka*)

Group	Mean	Median	Standard deviation	Minimum	Maximum
Members	6,587	5,000	4,305	360	16,600
Non-members	4,668	5,000	2,696	1,600	12,000
Total (both groups)	5,958	5,000	3,934	360	16,600

*NOTE: $1.00 is worth approximately 65 Bangladeshi Taka (BDT).

The gross income of FUG member's (6,587 BDT) is 41% higher per month on average than that of non-members (4,668 BDT) (Table 2). One possible reason for this is that NSP actually creates more income-earning opportunities for FUG members. Members receive various types of training and can thus earn more from different sources. Total expenditures by members are also higher than those of

non-members in terms of clothing, education and health care. These results suggest that FUG members may lead a more financially solvent lifestyle. Although the cost of general education is the same, some women from both groups send their children to private tutors for better education, depending on their financial status. Furthermore, results show that only FUG members provide a dowry for their daughter's wedding. From the above evidence, we can surmise that FUG members are more financially secure than non-members.

While the financial status of women FUG members is better than that of non-members, it is still not secure, and they try to survive by taking loans. Fifty percent of women FUG members received credit from NGOs (eight NGOs unrelated to NSP provide credit to villagers at Satchari National Park); 16% took a loan from the bank; and 33% borrowed money from neighbors or other relatives. On the other hand, all women FUG non-members took loans from their relatives, indicating that they did not enjoy the same level of access to formal credit sources. One reason for greater access to financing among FUG members may be that these women are more socially empowered. In Bangladesh, especially in rural areas, empowered women experience more social status and mobility, and thus have greater access to financial networks and services. Other dimensions of empowerment are discussed in the following section.

Socioeconomic empowerment

Women play a significant role in resource management because of their diverse skills, their knowledge, and their experiences, which are different from those of men (Brown and Switzer 1992). NSP gives local women an opportunity to participate in resource management by allowing them to join FUGs. FUG membership also empowers women in terms of their income-earning opportunities, health, decision-making power, and skills development. In Bangladesh, women are deprived of status and respect in both their family environment and the larger society. However, after joining a FUG, about 22% of women reported that they received greater respect in both their community and their own families. Moreover, over half of these women (12%) reported that they gained greater decision-making power in their own households. In addition, approximately 26% of female FUG members said they enhanced their employment status, and 17% said they increased their income (Table 3).

Table 3: Benefits female FUG members have received from NSP participation

Category label	Members	
	Count	% of respondents (n=60)*
Increased income	13	21.7%
Better health	7	11.7%
Better employment	20	33.3%
More decision - making power	9	15.0%
More respect in family and society	17	28.3%
Increased skills	5	8.3%
Other benefits	5	8.3%

*Note: Due to multiple responses, percentages do not add up to 100%.

In terms of decision-making power, 20% of female FUG members reported that they make most decisions in the household, compared with only 12% of non-members. However, approximately 55% of members and 61% of non-members report that both men and women make major decisions collaboratively (Figure 2).

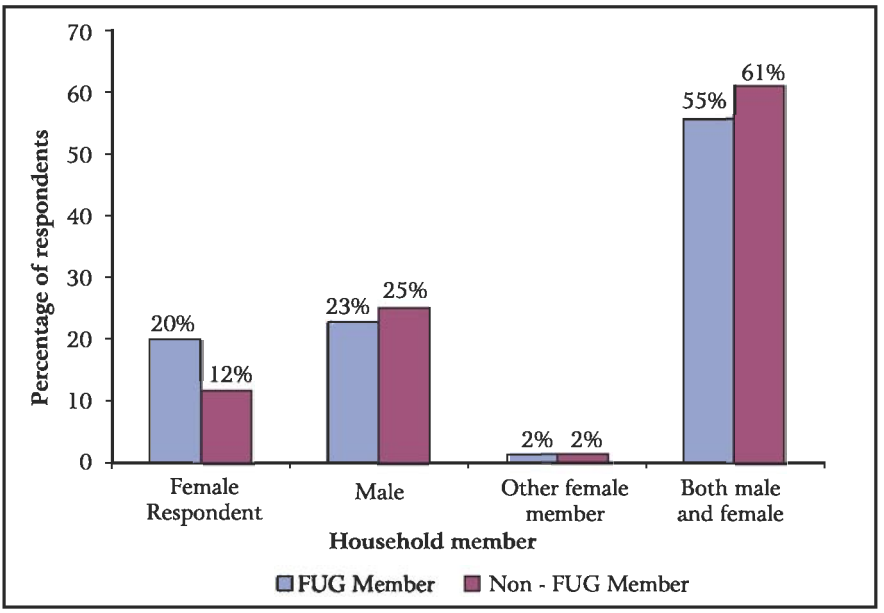

Figure 2: Who has the decision-making power in the household?

Training is a key component of NSP activities in the communities surrounding Satchari National Park. Results reveal that nearly 59% of female FUG members

received training and 41% of these have since become involved in AIGAs. Furthermore, NSP has provided 76% of those FUG members who received training in livestock maintenance with a cow, while approximately 16% of them received seeds and accompanying training for their home and vegetable gardens. As a result, many of the FUG members now have their own vegetable gardens and livestock, whereas before they worked as a tenant in other villagers' gardens. They not only earn money from these activities, but can also meet their household's nutritional requirements. NSP does not charge any fees for training their participants, nor do they generally provide cash grants or loans to them. Instead, they provide the necessary equipment and raw materials to members upon completion of training (Table 4).

Table 4: Training activities provided to FUG members by the Nishorgo Support Project

Type of training	Members	
	Count	% of respondents
Cow fattening & milk cows	28	76%
Plant nursery development	2	5%
Fish culture	1	3%
Home and vegetable gardening	6	16%
Total responses	37	100%

Physical and material well-being of households

Involvement in FUGs has also helped women to improve their own physical and material well-being, as well as that of their household members. With respect to health status, however, there is little evidence that FUG involvement has enhanced the health of members' households. In fact, in some cases, the health situation was worse for FUG members' households. For instance, results show that 16% of members' households have suffered from acute illness, while none of the non-member households suffered from such illnesses. Moreover, approximately 32% of female FUG members' households were affected by stomach-related diseases, compared with only 15% of non-members' households. During the survey period (April 2007), people generally suffered from different seasonal illnesses. Despite these

discrepancies in the incidence of illness and disease, it is encouraging that almost 100% of both member and non-member households consulted doctors, and that approximately 92% took medicines. Furthermore, the majority of both members and non-members reported that they use water from deep tube-wells for their daily household needs. As a result, both groups are more secure from water-borne diseases. Nonetheless, approximately 10% of FUG member households reported suffering from a water-borne disease during the past year, perhaps because they used water from shallow tube-wells; whereas nearly all of the non-members used water from deep tube-wells and none were affected by water-borne diseases. Even when considering stomach illnesses, which are frequently transmitted through water, the incidence among non-members is considerably lower (42% for FUG members versus 15% for non-members).

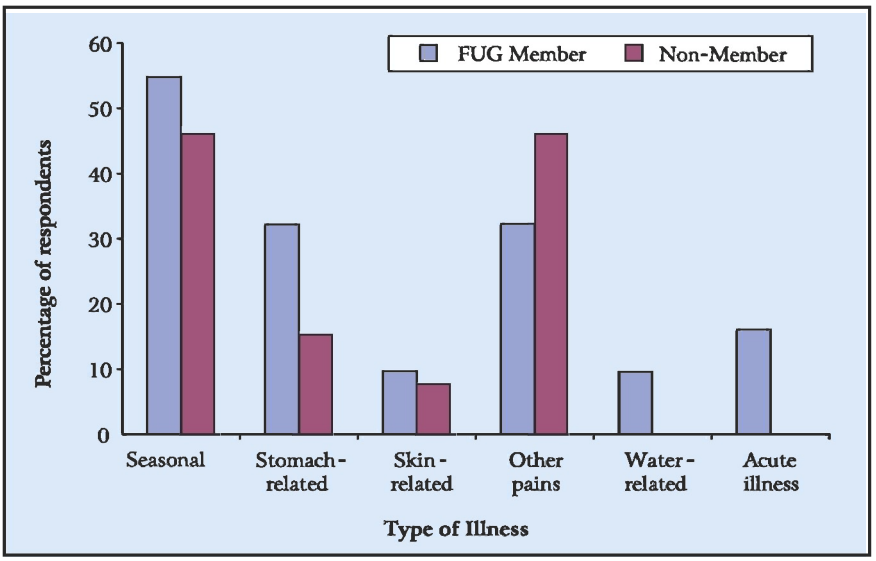

Figure 3: Health status of FUG member vs. non-member households

Approximately 80% of the homes of both members and non-members were built of mud, while 11% of non-members' and 4% of members' houses were made of straw. Furthermore, approximately 4% of FUG members' houses were built with concrete, whereas none of the non-members' were. This suggests that FUG members' homes had more developed infrastructure.

Conclusions

Promoting sustainable rural livelihoods requires the building of household and community assets. The livelihoods of those respondents surveyed in this study are mostly agriculture-based. I found little difference in the types of households, means of transport, livestock, ornaments, and other equipment between FUG members and non-members. Likewise, I found few advantages in education or health among FUG members. I did, however, find relatively large differences in terms of income, expenditures, and socio-economic empowerment. These differences suggest enhanced livelihoods of members in the future, in terms of employment opportunities, income generation, socio-economic empowerment, and physical and material well-being. Moreover, these changes in household status among FUG members may influence other stakeholders, especially non-member women, to participate in FUGs and NSP activities.

The main objective of this study was to analyze the impact of participation in co-management activities of NSP on the livelihoods of female FUG members at Satchari National Park by comparing them with non-members. The results reveal that involvement of female FUG members in NSP activities has increased within the past year. After participation in these activities, a majority of female FUG member households have left the fuelwood collection profession and have become more involved in AIGA activities – such as cow fattening, nursery development, poultry rearing, and fish culture – thanks to NSP training. Non-members, on the other hand, have not reduced their involvement in fuelwood collection, which is destructive to the forest. Thus, a woman's degree of involvement in a FUG appears to correlate with her household's level of dependence on the forest. The overall gross income and expenditure on various items such as clothing, education, and health care was also greater among members than among non-members, suggesting that the households of FUG members may be more economically solvent. Finally, more female FUG members than non-members report being empowered, in the form of making major decisions in their households.

Results from this report suggest that women who participate in the activities of NSP, and collaborate in conservation efforts via the FUGs, can enhance their livelihoods through advancing their participation, their income-generating opportunities, their socioeconomic empowerment, and their physical and material well-

being. However, to make their livelihoods truly sustainable in the long run, a lot more support is required from NSP, especially for the women of Ratanpur and Baghbari villages. These women want more skill development training, more equipment and raw materials, and more financial capital so that they can invest in productive activities and infrastructure development. Although different types of NGOs are providing them with micro-credit, many women are unable to repay their loans and expect assistance from NSP. However, subsidizing loan payments is not an effective use of NSP's funds. Fulfilling other livelihood requirements may encourage members of FUGs to invest more and to create more income-generating activities, thereby enhancing their own livelihoods. NSP needs to integrate these suggestions into their co-management policy.

In Bangladesh, local socio-cultural values and gender norms are very strong, so any new interventions from the outside are often treated skeptically or negatively. As a result, women from forest villages often fail to realize long-term positive impacts for their livelihoods. Some co-management activities are aimed at changing the attitudes of local people through involving them in activities at designated project sites. The sample in this study was quite small and the views of respondents may not necessarily reflect the overall picture. A more in-depth study is needed in order to tease out the specific impacts of women's participation on their socioeconomic, cultural and material well-being. Nonetheless, these findings provide important insights for further research and can contribute to the improvement of co-management activities for PAs like Satchari National Park. They may also be helpful to policy-makers and planners, researchers, and program managers for implementation of future co-management plans and activities in Satchari National Park and other PAs. Rao *et al.* (2003) suggest that, to succeed in co-management planning and practice, local people must be more aware of, and more involved in, management procedures and decisions. This study suggests that, due to their close connection with the forest and their important social and economic function in maintaining household well-being, women can play a critical role in this regard.

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Plate 1:
The researcher conducting survey interviews at Satchari National Park.

Plate 2:
Cows provided by NSP to a FUG member at Satchari National Park

Plate 3:
After receiving training, a FUG member built her own poultry farm

Plate 4:
Members of Ratanpur Mohila Dal working in their vegetable garden

Assessing Stakeholder Participation in Co-management Activities at Chunati Wildlife Sanctuary

Md. Kabir Hossain Patwary[1]

Abstract

While theorists and practitioners consistently call for widespread participation in ecosystem management and environmental planning in general, few studies have questioned the assumption that stakeholder participation during the planning process will lead to stronger, more durable management plans. This paper explores the importance of protected areas to local people, measures stakeholder participation in planning and co-management activities, and identifies issues or constraints to sustainable management in Chunati Wildlife Sanctuary (CWS), Bangladesh. An evaluation mechanism similar to the one described in this paper will be helpful to protected area management authorities when assessing and modifying their management plans to mitigate conflicts, ensure active participation, and build relations with local people. This paper concludes that conservation efforts should involve communities in decision-making processes and link benefits from protected areas to local people.

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Introduction

Resource managers and scholars widely recognize tropical deforestation as one of the most critical environmental problems facing the world today, with serious long-term economic and social consequences. Tropical forests play a special role in the conservation of biodiversity. They are home to 70% of the world's plants and animals – more than 13 million distinct species (Font and Tribe 2000). With the world's tropical forest cover and the associated biodiversity decreasing at alarming rates, there are powerful and persuasive arguments to designate large parts of the tropics as protected areas. This is because parks and protected areas (PAs) are seen as central instruments for the conservation of biological diversity. According to the 4th World Congress on National Parks and Protected Areas (IUCN), each country should designate a minimum of 10% of each biome under its jurisdiction as a protected area (IUCN 1993). Many countries have already included more than 10% of their territories in PAs.

In Bangladesh, one of the world's most populated nations, PAs covered only 1.67% of the country's territory as of 2006, compared with 22% for neighboring Bhutan, 12.7% for Thailand, 11.5% for Malaysia, 9.6% for Sri Lanka, 5.1% for India and 12% for the world (Chape *et al.* 2003, Fox *et al.* 2006). Overall, Bangladesh ranks 129th out of 155 countries in terms of the percentage of its national territory under PA status (UNEP-WCMC 2005, Fox 2006). On a per capita basis, Bangladesh has one of the lowest ratios of protected and intact forests in the world (NSP n.d.). As a result, in 2004 the Ministry of Environment and Forests, the national authority concerned with forests, wildlife and PAs through the Forest Department (FD), created a new approach to PA management called the Nishorgo Support Project (NSP). NSP seeks to build capacity for community-based management or co-management in five PAs selected as pilot sites for the new approach (NSP n.d.).

Protected areas are storehouses of biodiversity and the last remaining bastions of Bangladesh's vital natural resources, which fuel continuous ecological, economic and social development. According to the Wildlife (Preservation) (Amendment) Act 1974, a PA is an area that has been declared legally protected because of its high ecological or biodiversity value, or because of its diversity or rarity of wild plants, animals, ecosystems and intrinsic scenic beauty. Wildlife sanctuaries,

according to Bangladesh's legislation, are intended to fulfill four basic functions that are complementary and mutually reinforcing: (1) a conservation function – to contribute to the protection of the environment or habitat of specific species (i.e., landscapes and ecosystems); (2) a regulative function – to provide clean water, air, and climatic and environmental regulation; (3) a logistical function – to support exchange related to local, national and international issues of conservation for the promotion of scientific research and environmental education, monitoring and information; and (4) a development function – to foster the improvement of social and economic status of local people to ensure sustainable use of natural resources under traditional patterns of land use (GOB 1992, Rosario 1997).

In Bangladesh and other developing countries, PAs are often established on lands possessed and used by local people. Human communities, especially those living in and around PAs, often have important and long-standing relationships with these areas. Local indigenous communities depend on the resources of these areas for their livelihoods and cultural survival. They recognize that there can be no agricultural development without water, the supply of which is guaranteed by forests. Protected areas directly affect rural farmers who have been living in and around natural ecosystems.

Protected areas cannot easily coexist with communities that are hostile to them (DeBoer and Baquete 1998, Maikhuri *et al.* 2000, Rao *et al.* 2002), but they can achieve significant social and economic objectives when placed in a suitable context (Buch-Hansen 1997, Rao *et al.* 2002). The establishment and management of PAs and the use of resources in and around them must be socially responsive and just. In many cases, the continuation and development of human activities in PAs should be accepted, insofar as these activities are compatible with conservation objectives (Wells and Brandon 1992). Community participation and equality should be strived for in decision-making processes (IUCN 1993, Singh *et al.* 2000, Papageorgiou 2001).

The decision-making process may be thought of as a series of interconnected steps, leading from the recognition of a problem and the identification of potential solutions to the selection and adaptation of an appropriate strategy (Sewell 1973). The outcome of the decision-making process is affected by the views of the various participants and the levels and types of participation in the process (White 1966).

To succeed in incorporating conservation commitment in planning and practice, one must be aware of, and involved in, the concerns of others. For example, success in protecting a landscape in a nation or region depends not just on government support and local management organizations; it also depends on the reaction and involvement of the local population.

Past research on PA management in Bangladesh focused primarily on flora and fauna or the impact of PAs on human populations living in and near them. Few studies, however, have examined the levels and types of participation of local people. Experiences to date show that the cost borne by communities is high relative to the benefits received. Systematic research to understand the needs and desires of local populations living in or adjacent to PAs might offer new insights (Trakolis 2001).

Despite widespread recognition, participation of local people is relatively new in conservation circles in Bangladesh and is often more of a myth than a reality. As a result, many PAs today remain little more than "paper parks". Due to the difficulties involved in measuring 'participation' and determining the levels at which participation should take place, or who should be involved and when, many people doubt the effectiveness of local participation in preserving biodiversity and enhancing human welfare. On that basis, this study seeks to explore the importance of participation in achieving sustainable PA management in a context where people traditionally depend on wildlife and habitats for their livelihoods. Using the case of Chunati Wildlife Sanctuary (CWS) in southeastern Bangladesh, the specific objectives of this study are:

1. To assess the types of participation of local stakeholders in the planning, management, and evaluation of co-management activities of NSP
2. To highlight that given the dynamism and complexity that characterize CWS and its inhabitants, active participation of local stakeholders in the management and conservation of biodiversity is essential if NSP is to be effective
3. To conclude with recommendations for implementing co-management in CWS

This study also seeks to learn lessons from CWS that could be applied in other PAs or buffer zones in Bangladesh and possibly promoted as a national, regional or local

level development strategy. I hope that this study will contribute to a better form of community-based management in PAs in Bangladesh.

Conceptual framework

The sustainability of biodiversity and environmental resources in Bangladesh is threatened by several factors. One factor is land degradation through deforestation, habitat destruction and landscape fragmentation resulting from changed land uses, notably the expansion of agriculture and new settlements. Population growth is continually increasing the need for agricultural production. Another factor threatening the country's wildlife is hunting. Some endangered species fetch high prices in illegal international markets. Profit encourages poaching, which is a serious threat to a limited number of species, notably the Bengal tiger, deer and elephant. If the above factors are allowed to operate unchecked, it is obvious that biodiversity will be depleted as both wildlife and their habitats diminish.

Several case studies document conflicts between smallholder agricultural settlements and the protection of wildlife. Fiallo and Jacobson (1995) surveyed settlements both inside and adjacent to Machalilla National Park in Ecuador. The majority of respondents opposed the park and believed that the land should be used for agriculture. However, Respondents who perceived personal benefits from the park had a more positive attitude and pointed out that tourism created jobs. Fiallo and Jacobson found that negative attitudes towards the park stem from three main factors. First, there was a lack of local people's involvement in the establishment and management of the park. Second, the most respondents did not perceive any benefits from the park. Third, there had been a long history of confrontations between local people and park staff.

Recent innovations in improving the sustainability of wildlife management focus on the transfer of power and responsibility from central governments to local people. Such developments are most often referred to as community-based management or co-management. According to Colfer *et al.* (1999), co-management is a wildlife management approach "designed to manage conservation areas in close cooperation with local people". McCay and Acheson (1987) define co-management as the right of communities to share management power and responsibility with the state. Thus, while the concept of community-based management

emphasizes the role of local communities at the decision-making level, co-management has an emphasis on cooperation and interaction between the state and local communities.

Well-documented cases of community-based wildlife management are found in widely different cultural and physical settings: Sarawak, Malaysia (Horowitz 1998); Quebec, Canada (Pearse and Wilson 1999); Sagarmatha National Park, Nepal (Rao *et al.* 2003); and Annapurna Conservation Area, Nepal (Hough and Sherpa 1989, Apte and Kothari 2000). The most famous case, however, is CAMPFIRE (Communal Areas Management Program for Indigenous Resources) in Zimbabwe. CAMPFIRE has transferred management responsibility as well as the authority to collect fees from tourists and hunters from the central government to the local level. CAMPFIRE operates under the principles that communities should have full choice in using wildlife revenues, and that management functions should not be performed at a higher level when a lower level can perform them (Child 1996).

Based on his study of the need for wildlife corridors and buffer zones around Lake Manyara National Park in Tanzania, Mwalyosi (1991) also advocated the need for a new strategy in wildlife conservation. He suggested that rural populations adjacent to the national park should be integrated into decision-making on conservation, including establishment of proposed corridors and the buffer zones around them. They should also be allowed to exploit some resources from the park when this does not conflict with conservation interests, such as fish, dead fuelwood, and rock or sand for building purposes. Mwalyosi further suggested that compensation for crops and property damaged by wild animals should be considered.

Stakeholder participation in planning, implementation and management of PAs is receiving increasing attention for a variety of reasons (Ashley and Roe 1998). To residents living in or near PAs, there might be new opportunities for jobs, business enterprises and skill development. Community-based ecotourism can be a way to earn benefits from wildlife and tourists that in the past brought many costs. Community-based conservation programs might enable park and wildlife management to become financially viable and help to ensure more community control over use of land and natural resources. Most conservationists and development practitioners now recognize the crucial role played by local people in planning, imple

mentation and management of natural resources, such as wildlife and habitat, and many have adopted the "if it pays it stays" principle. Community-based wildlife management is one way of generating high and tangible local benefits from wildlife use and hence creating incentives for conservation by local residents. Donors, including the World Bank and the Global Environment Facility (GEF), are increasingly interested in funding projects that combine development with a high degree of community involvement or local stakeholder participation in order to realize conservation and sustainable development objectives.

Indeed, with the information above in mind, I was quite convinced of the importance of people's participation in PA management. Then, what exactly is meant by the term "participation"? An appealing World Bank definition (World Bank 1994) states, "Participation is a process through which stakeholders influence and share control over development initiatives and the decisions and resources which affect them." Most scholars in the developmental arena explain participation as a process. In this process, local people have roles and participate in every step of development with encouragement and guidance from a developer who is an outsider. In this case study in CWS, I consider local community participation to be the ability of the community to influence the co-management activities that have an impact on them.

Deshler and Sock (1985 cited in Selender 1997) propose a model where types or nature of participation are categorized on the basis of the degree of control exerted by participants (Figure 1). The metaphor they use to illustrate this concept comes from Arnstein's "ladder of participation" (1967). This ladder has eight rungs representing: 1) manipulation, 2) therapy, 3) informing, 4) consultation, 5) placation, 6) partnership, 7) delegated power, and 8) citizen control (Arnstein 1967). These categories are grouped into four classes based on the relationship between the extent of control or power and participation. These classes are: 1) domestication, 2) paternalism, 3) cooperation, and 4) empowerment. Domestication and paternalism are defined as "passive participation", while cooperation and empowerment are "active participation".

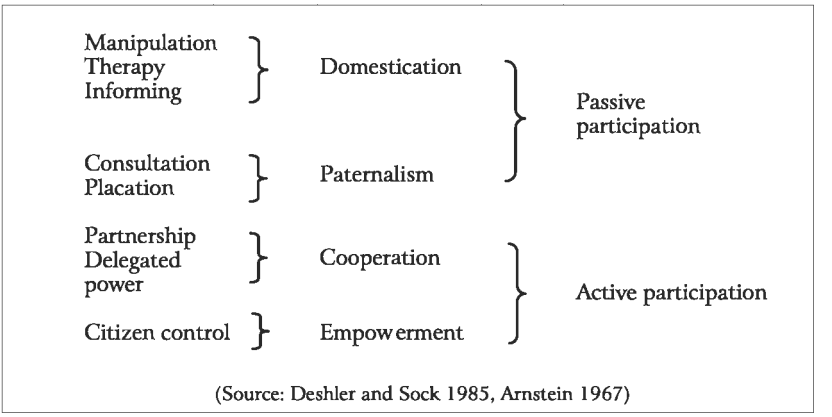

Figure 1: Types of participation

Domestication is a type of participation where control over a given activity lies in the hands of planners, administrators, local elites, scientists or professionals. Domestication is achieved by using pseudo-participatory techniques to manipulate people to do what outsiders perceive as important rather than to empower participants. Participation as paternalism suggests that power and control remain in the hands of an external agent or an elite community member. Members of the participating group receive information and are consulted, assisted or placated. They may be informed about activities, but have no influence over decision-making or control over benefits. Participation as cooperation involves people working with outsiders to implement activities intended to benefit them directly. Decision-making takes place through dialogue between insiders and outsiders. Participants are also actively involved in implementation. Power and control are shared throughout the project, which is ideally an inductive, bottom-up rather than a top-down process. Participation as empowerment is an approach in which people hold complete power over and are fully in control of a program or an institution, including decision-making and administrative activities. Participation occurs at the political, social, cultural and economic levels. Empowerment is achieved through growing consciousness, democratization, solidarity and leadership. Participation for empowerment usually characterizes autonomous processes of mobilization for structural, social and political changes.

Pimbert and Pretty (1995) provide another model or typology of participation, which suggests a continuum from passive participation (where people are involved merely by being told what is to happen) to a form of collective action (active participation) in which local people set and implement their own agenda in the absence of outside initiators. Between these two extremes lie various intermediate levels or degrees of participation. Disaggregating the notion of community participation in terms of major dimensions provides a useful analytical tool for identifying ways in which communities may become directly involved with, and exert a decisive influence upon, the design and management of projects. Table 1 outlines these dimensions with examples from Biodiversity Monitoring and Evaluation (BIOME) Projects (BSP n.d.).

Sally Oliphant points out that whether participation is regarded as a means to achieving an end, an end in itself, or merely a matter of principle or of practice, the key question is whether it makes any real difference to those most directly affected by a planned intervention (Oliphant 1999). In other words, does the form of participation enable the communities to have their voices heard? Does it enable them to assert their own ideas about what the problems are, what solutions need to be found, and what resources ought to be made available? Does it enable the creation of a shared reality or system of meaning among the key players as they work together in the mutual construction of a project? These questions highlight the key elements that define participation as referred to in this paper.

A question also arises about the extent to which participatory efforts enhance or improve conservation and the sustainable management of natural resources (Ulfelder and Poats 1997). Although this is difficult to answer due to the lack of necessary ecological data over time, this argument is supported by the case of Chunati Wildlife Sanctuary (CWS), where the lack of participation has resulted in extensive degradation of the PA. The following sections look at how and to what extent participation and consultation with local communities was incorporated into the planning, implementation and evaluation of co-management activities in CWS, and presents views from the local communities involved.

Table 1: Types of participation with example from BIOME Project

Typology	Characteristics or component of each type	BIOME project context and activities
Passive participation	People participate by being told what is going to happen or has already happened. This tends to be a unilateral announcement, and people's responses are not taken into account.	Pre-LIFE: Declaration of Mamili and Muduma National Park
Participation in information giving	People participate by answering questions designed by researchers and project managers. They do not have the opportunity to influence proceedings, as the findings of the research or project design are neither shared nor checked for accuracy.	AMCFE: Involvement of local people in research on useful plants
Participation by consultation	People participate by being consulted, and external agents listen to their views. These external agents define both problems and solutions, and may modify these in light of people's responses. In such a consultative process people do not share in decision-making as their views may or may not be taken on board.	KENGO: Research identifying and documenting indigenous vegetable and fruit trees
Participation for material incentives	People participate by providing resources (e.g., labor in return for food, cash or other material incentives). Such people are not involved in the experimentation or the process of learning and have no stake in maintaining activities when the incentives end.	MADAGASCAR WETLANDS: Use of local people as support staff in projects
Functional Participati on	People participate by forming groups to meet predetermined objectives related to the project. This involvement tends to not be at early stages of project cycles or planning, but rather after major decisions have been made. These institutions tend to be dependent on external initiators and facilitators, but may become self-dependent.	NATURAMA: Formation of village clubs to support management of the Kabore Tambi National Park
Interactive participation	People participate in joint analysis, which leads to action plans and the formation of new local groups or the strengthening of existing ones. These groups take control over local decisions, so people have a stake in maintaining structures or practices.	CAMPFIRE: Community-based natural resource management initiatives
Self-mobilization	People participate by taking initiatives independent of external institutions to change systems. Such self-initiated mobilization and collective action may or may not challenge existing inequitable distributions of wealth and power.	LIFE: Establishment of the Caprivi Arts and Culture Association

Source: Modified from Pimbert and Pretty 1995

Background

The area selected for study was Chunati Wildlife Sanctuary (21°40' N Latitude and 92°07' E Longitude), hereafter referred to as CWS. Located in the southeastern region of Bangladesh, approximately one and a half hours away from Chittagong by car, CWS attracts both domestic and foreign eco-tourists to view elephants. As a result, an eco-park is currently under development inside the Sanctuary (locally known as "Elephant Sanctuary"). CWS has an area of 7,764 hectares and harbors a great diversity of endemic wildlife. It attracts international attention due to its ecological uniqueness and great potential for ecotourism. It was declared a sanctuary in 1986 under the Wildlife (Preservation) (Amendment) Act of 1974, formulated by the Ministry of Environment and Forests (MOEF).

The climate in CWS is tropical and heavily influenced by the topography and the southwest monsoon. Average annual rainfall is 3,000 mm, with maximum rainfall during June to September. Temperatures vary on average from minimum 14° C in January to maximum of 32° C in May (Forest Department 2006). This mild year-round climatic variability, high humidity and rainfall supports a wide range of habitats and niches, and thus allows many opportunities for a biologically diverse flora and fauna to evolve. So, it is not surprising that CWS is home to an extraordinary variety of living organisms and can provide a major contribution to our understanding of ecology and biological diversity. CWS is an area of mega-biodiversity, rich in fauna and flora species (Rahman *et al.* 2000, Khan and Haq 2001, Rahman and Hossain 2003). A total of 143 plant species, including 17 fodder species suitable for elephants, were reported by the IUCN (2003). The sanctuary holds a variety of animals (two species of reptiles, two species of mammals, and eleven species of birds) and many other forest dwelling and wetland associated species. CWS originally supported mixed tropical evergreen and semi-evergreen forests that over time became substantially degraded and many low-lying areas in valleys have been converted into paddy cultivation. The landscape surrounding CWS consists of the following six habitat types (Forest Department 2006): reserve forests (small patches of secondary forests), plantation forests, grasslands/bamboos, wetlands/water bodies, private lands/cultivated fields and village commons.

The resources of the sanctuary are threatened by a variety of forces. Encroachment, slash-and-burn agriculture and extraction of forest products are carried out by

many of the region's residents as a means of survival. Heavy dependence on forestland has resulted in an opposition by local people to conservation efforts. Co-management is particularly useful for communities living in and around PAs. Resource managers should consider linking development with conservation and should be aware of the potential for co-management to have negative effects upon local environments (Apte and Kothari 2000). CWS is in close vicinity to fifteen villages composed of seventy settlements (locally called *para*). Nearly one-third of the total population is unemployed. As a result, most villagers are poor with a high dependence on natural resources. As CWS provides food, fodder, fuelwood, medicinal plants, clean water, and other non-timber forest products and services to the people, the area must be protected.

A number of organizations, conservationists, and researchers have proposed that co-management could help to provide local communities with alternative income sources while simultaneously helping them to preserve their local environment. The NSP model of community participation seeks to meet the basic requirements for co-management and thus has the potential to be economically, ecologically and socio-culturally sustainable. To achieve the objectives of the World Congress on National Parks and Protected Areas, a detailed five-year management plan was prepared for CWS by NSP (2004 to 2009). The main thrust of this plan was community-based management of the sanctuary via eco-restoration and eco-development (Forest Department 2006). Thus, there are several factors that make the sanctuary an appropriate location for researching stakeholder participation in protected area co-management activities.

The management and conservation institution of CWS is relatively complex and involves a number of laws, policies, plans, organizations and levels of coordination and participation by an array of different stakeholders. Key stakeholders include NGOs, private businesses, visitors, tour operators and local populations living in and around the sanctuary. This case study examines the notion of local participation only as applied to the co-management committees and councils set up by NSP. The following research questions were designed to analyze the levels and types of participation of local communities in the co-management activities of NSP:

- How, and by whom, was the problem defined prior to the NSP co-management initiative?

- When and how did communities find out about the co-management of NSP?
- Was there any consultation? If so, in what form, and with whom?
- To what degree have the communities been involved in decision-making and in the preparation of the co-management plan for CWS?
- To what degree has there been information dissemination to, and communication with, the communities?

Methods

I combined qualitative and quantitative methods, conducting purposive sampling to select a survey population of 30 participants, including three members from the co-management committee (CMC), three members from the co-management council, and four members from the community patrolling groups (CPGs). The remaining 20 interviewees were selected from the portion of the population that had not participated in co-management activities (non-participants NSP). Of the 30 respondents, 20 were male and 10 were female. The selection of these categorical variables of participants enabled me to examine the effects of the active participation of specific groups rather than simply an overall measure of representation. All of the respondents were local people, over 18 years old, and native to the area. The survey was conducted between February and June of 2007. The respondents knew that I was an officer of the FD conducting academic research, but that the study area was not my place of work and that I was in no way related to the local management authority. This assisted me in gaining their cooperation and frank answers and opinions. I also studied the roles, responsibilities, and power structures of the different organizations and project activities.

The primary data I collected included information on local people's awareness of the objectives of the sanctuary's co-management initiatives, their views about the importance of participation in the co-management activities, household level information, and other qualitative information. I used both structured and semi-structured questionnaires and administered them through personal interviews and observation (Mukherjee 1995). I conducted an initial reconnaissance survey to acquaint myself with the area and to collect some basic data about the physical settings, land use practices, and the people and their culture. I discussed logistical

arrangements and introduced myself to villagers of the community during this visit. I collected secondary information from various sources including the internet, journals, and books as well as project reports from NSP, the FD, United States Agency for International Development (USAID), and the International Resource Group.

I employed descriptive statistics to summarize the quantitative data, including simple frequency distributions and percentages. Simultaneously, I sorted through the qualitative information collected from open questions and dialogues to identify areas where interviewees agreed and disagreed. This analysis assisted me in understanding the situation in greater depth and detail. I used the types of stakeholder participation described by Deshler and Sock (1985, cited in Selender 1997) as a framework and model of participation (Tables 3 to 6).

Quantitative results and discussion

I collected information on people's ages and occupations. Among the respondents, the 31-40 year-old age class was the largest (17 interviewees) followed by the 21-30 and 41-50 year-old age classes. Although southeastern Bangladesh has more females than males on average, the number of males in the focal village was higher. The majority of residents were farmers, although many have secondary occupations such as animal husbandry, work in a household industry, wage labor, or government service.

Assessing knowledge of local people about co-management of CWS

I asked respondents about their knowledge of the objectives of co-management in CWS and the source of their information. Information was sought on how much they knew about co-management in CWS twenty years after the establishment of the sanctuary and two years after co-management was initiated. Except for a few women, most respondents answered that they knew the objectives of the co-management of CWS. However, when asked to list the objectives, most respondents started with protection of the environment in general, followed by protection of fauna. Only a few respondents who had interacted with researchers answered that the objectives were to protect elephants and wild pigs (Table 2).

Table 2 summarizes the data I collected about the knowledge of local inhabitants about co-management. Most respondents (28 interviewees) stated village meetings

or word of mouth as their primary source of information about co-management, followed by interactive meetings with the management authority of NSP/FD (21 interviewees). Some individuals (9 interviewees) gave "interaction with a researcher" as one of the sources. Respondents said that they had seen and read the brochures and pamphlets brought by the management authority, but none of them now possessed these materials nor had they seen them during the last year. A few respondents who participated in the group discussion meetings that I organized for this research stated that the objectives of my research were the objectives of co-management.

Table 2: Knowledge of local inhabitants about co-management in CWS

	Response	Males	Females
A	Knowledge of objectives Question: Do you know the objectives of the sanctuary's co-management?		
	Yes	20	8
	No	-	2
B	List of objectives mentioned by respondents* Question: If yes, mention the objectives that you know		
	Protection of the environment in general	20	7
	Protection of fauna in general	17	6
	Protection of elephants	8	3
	Protection of wild pigs	2	1
C	Source of information of the objectives Question: How did you know about the objectives of Sanctuary co-management?		
	Co-management authority meeting of NSP/FD	14	7
	Village/local community meeting or word of mouth	20	8
	Interaction with researcher	5	4

*Note: Data in columns include multiple responses to open-ended questions

Assessing participation of local stakeholders: In this case study, I assessed participation as defined by Deshler and Sock (1985, as shown in Figure 1 in the conceptual framework) (Deshler and Sock 1985). I measured people's participation for four separate phases of co-management activities: planning, implementation, evaluation, and sharing of benefits. For each activity I identified four concerns where people's participation could be elicited and evaluated in terms of domestication (D), paternalism (P), cooperation (C) and empowerment (E) (Tables 3 to 6). If three of the four responses to these activities were of the passive participation type (domestication plus paternalism), I then classified the participation as passive participation. Otherwise, the respondent was considered to exhibit active participation. I summarized the responses of these four (D-P-C-E) concerns with an average for each phase of co-management/project activity. If an activity received an equal number of passive and active participation responses, I then considered the respondent to be exhibiting a combination type of participation.

Participation in planning phase: Table 3 shows how active respondents considered their own participation in the planning of co-management activities to be. The four activities I assessed for participation were problem analysis/objectives setting, decision-making, rules and regulations, and yearly planning. My results suggest that respondents participate in all types of planning activities, but most considered themselves passive participants in these activities.

Table 3: Respondents' assessment of participation in planning of co-management activities

Activities		Number (n = 30)	%
Problem analysis			
D	All of the problems in my community were examined by local elites, NSP and outsiders	15	50
P	I was consulted by the local elites/NSP/outsiders	3	10
C	I actively cooperated with the local elites/NSP/outsiders in analyzing our problems	5	17
E	All of the problems in my community were fully analyzed by us, the local people	7	23

Activities		Number (n = 30)	%
Decision-making			
D	All of the co-management activities were examined by local elites/outsiders	12	40
P	I assisted the local elites/outsiders in the decision-making	11	37
C	I was actively involved in decision-making and dialogue with the local elites/NSP	3	10
E	Decision-making was done entirely by us, the local people	4	13
Rules and regulations			
D	All of the rules and regulations were set by local elites/FD/NSP/outsiders	15	50
P	I was consulted by local elites/FD/NSP/outsiders in setting the rules/regulations	10	33
C	I actively worked with the local elites/NSP in setting the rules and regulations	3	10
E	All of the rules and regulations were decided upon by us, the local people	2	7
Yearly planning			
D	Yearly planning of the co-management activities was carried out by local elites/FD/NSP/outsiders	13	43
P	I was consulted by the local elites/FD/NSP/outsiders in the yearly planning	12	40
C	I was actively involved in coordination with the local elites/FD/NSP/outsiders in yearly planning	-	-
E	All of the yearly planning of activities were entirely handled by us, members of the community	5	17

Legend: D = Domestication, P = Paternalism, C = Cooperation, E = Empowerment

Table 3 shows that in terms of problem analysis, 60% of the respondents assessed their participation as passive (domestication 50% and paternalism 10%). Nonetheless, 40% considered that they were active participants in this process (cooperation 17% and empowerment 23%). The majority of the respondents felt that although they knew their community well, it was the local elites and outsiders that analyzed the problems of the community. Likewise, in terms of decision-making about

co-management activities, the majority of the respondents (77%) viewed their participation as passive (domestication 40%, paternalism 37%). People did not feel they were as involved as local elites and outsiders in decision-making about co-management activities, and a few people felt they were involved in decisions concerning co-management (cooperation 10%, empowerment 13%). In terms of decisions affecting what rules and regulations were adopted to implement co-management, a large portion of the community viewed their participation in these activities as passive (domestication 50%, paternalism 33%). A few people felt they were actively engaged in these activities (cooperation 10%, empowerment 7%). Finally, 83% of the respondents assessed their participation in yearly planning of co-management activities as being passive (domestication 43%, paternalism 40%). People clearly felt that these activities were carried out mainly by local elite and outsiders. Only a few people felt that they were active participants in these activities (empowerment 17%).

Table 4: Respondents' assessment of participation in implementation of co-management

Activities		Number (n = 30)	%
Monthly meeting			
D	Monthly meetings were conducted by local elites/FD/NSP/outsiders	10	33
P	I assisted local elites/FD/NSP/outsiders in the monthly meeting	9	30
C	I had opportunities to share my ideas with local elites/FD/NSP/outsiders in monthly meetings	3	10
E	Monthly meetings were fully handled by local people	8	27
Choice of leader			
D	The leader was selected by local elites/FD/NSP/outsiders	20	66
P	I assisted the local elites/FD/NSP/outsiders in selecting the leader	2	7
C	I actively cooperated with local elites/outsiders to select the co-management leader	-	-
E	The leader was fully decided upon by the local people	8	27

Activities		Number (n = 30)	%
Setting-up of organizational structure			
D	The organizational structure was set up by the local elites/FD/NSP/outsiders	21	70
P	I was consulted by the local elites/outsiders when the organizational structure was being developed	-	-
C	I had opportunities to set up the organizational structure	1	3
E	The organizational structure was fully developed by local people in the community	8	27
Implementation of activities			
D	Implementation of all co-management activities was handled by local elites/FD/NSP	9	30
P	I had some involvement in the implementation of some co-management activities	8	27
C	I was actively involved in the implementation of co-management activities in collaboration with local elites/FD/NSP/outsiders	-	-
E	Implementation of all co-management activities was handled entirely by local people	3	43
Legend: D = Domestication, P = Paternalism, C = Cooperation, E = Empowerment			

Participation in implementation phase: Table 4 above shows how participants viewed their participation in project implementation. This phase was divided into four activities: monthly meetings, selection of leader, creating the organizational structure and implementation.

A majority of respondents (63%) assessed their participation in monthly meetings as passive (domestication 33% and paternalism 30%). Many participants felt that meetings were conducted and led by local elites. A significant portion of respondents (37%), however, felt that they actively participated in these meetings (cooperation 10% and empowerment 27%). The majority of respondents (73%) felt they were passive participants in the change of their leader (domestication 66% and paternalism 7%). Still, just over a quarter of the participants felt that they had

an active role in choosing the co-management leader (27% empowerment). In the past the community leader would have likely been the former leader's son or descendent.

In terms of organizational structure, the majority of respondents (70%) perceived their role to be passive. They felt that the organizational structure was the same as other villages' organizational structure and that it had been designed this way by the government of Chunati. Approximately 30% of respondents felt they actively participated in the set up of the organizational structure (cooperation 3% and empowerment 27%). Similarly, the majority of interviewees felt that their participation in the implementation of co-management activities was passive (domestication 30% and paternalism 27%). A large portion (43%), however, felt that they were actively engaged in the implementation of these activities.

Participation in the monitoring and evaluation phase: Participation in the monitoring and evaluation phase consisted of four primary activities. Selection of the monitoring and evaluation staff, participation in monitoring and evaluation activities, preparation of the annual evaluation, and assessment of the monitoring and evaluation information. Table 5 shows that most participants felt they were passive participants in the selection of monitoring and evaluation staff members (domestication 73%), and that their selection was done by the local elites. In contrast, a considerable number (27%) of respondents felt that monitoring and evaluation staff members were selected entirely by local people (cooperation 24% and empowerment 3%). In terms of assessing monitoring and evaluation activities, the majority of participants felt that they were passive participants (83% domestication). In terms of the annual evaluation, a vast majority felt they were passive participants (domestication 90%). Finally, in terms of information on monitoring and evaluation, all but one participant (97%) felt that they were passive participants in these activities. This means that in regards to monitoring and evaluation activities, local participants consider these activities to still be handled by the local elites and government.

Table 5: Respondents' assessment of their participation in monitoring and evaluation of activities

	Activities	Number (n = 30)	%
Selection of monitoring and evaluation (M&E) staff			
D	All of the co-management M&E staff were selected by local elites/outsiders	22	73
P	I was consulted by local elites/outsiders when they selected the co-management M&E staff	-	-
C	I actively collaborated with local elites/outsiders in selecting the M&E staff	7	24
E	All of the co-management M&E staff were entirely chosen by local people	1	3
Monitoring and evaluation activities			
D	All of the M&E activities of co-management were examined by local elites/outsiders	25	83
P	I assisted the local elites/outsiders in selecting M&E activities	-	-
C	I was actively involved with the local elites/outsiders in M&E activities	3	10
E	M&E activities of the co-management project were entirely handled by local people	2	7
Annual evaluation			
D	All annual M&E reports of co-management were handled by elite/outsiders	27	90
P	I was consulted by local elite/outsiders in processing annual M&E reports of co-management	-	-
C	I actively cooperated with local elite/outsiders in processing the annual M&E reports of co-management	-	-
E	All annual M&E reports of co-management were fully accomplished by us, the local people	3	10
Information of monitoring and evaluation			
D	All of the information of M&E in co-management activities was examined by local elites/FD/NSP/outsiders	29	97
P	I was informed by the local elites/FD/NSP/outsiders about the results of M&E	-	-
C	I was actively involved with local elites/FD/NSP/outsiders in giving information for M&E of co-management activities	-	-
E	All information from M&E activities was fully coordinated by local people	1	3

Legend: D = Domestication, P = Paternalism, C = Cooperation, E = Empowerment

Table 6: Respondents' assessment of their participation in benefit-sharing from co-management activities

Activities		Number (n = 30)	%
Benefits from natural resources (land, plants, animals, air, water, etc.)			
D	How to share benefits from natural resources was decided by local elites and/or outsiders	22	22
P	I was consulted by local elites/outsiders regarding the sharing of benefits from natural resources	-	-
C	I was actively involved with local elites/outsiders in deciding the sharing of benefits from natural resources	7	7
E	Local people control decisions regarding the sharing of benefits from natural resources	1	1
Benefits from materials (such as fertilizers, quality seeds, training goods, etc.)			
D	How to share material benefits was decided by local elites/NSP/FD/outsiders	25	25
P	I was consulted by local elites/FD/NSP/outsiders regarding sharing of material benefits	-	-
C	I was actively involved in dialogues with local elites/NSP/FD/outsiders regarding sharing of material benefits	3	3
E	Sharing of material benefits was entirely decided upon by local people	2	2
Benefits from social development (education, information, technology, etc.)			
D	My involvement in co-management was most often in the form of helping local elites/NSP/FD/outsiders	27	27
P	Although I learned new things about nature through the assistance of local elites/NSP/other outside agencies, this was quite limited because of our inability to interact with others from outside	-	-
C	Even if I was limited in my experience and capability, the interaction I had with local elites/FD/NSP/outsiders related to co-management activities was very educational to me	-	-
E	Involvement in co-management activities has given me many opportunities to improve my capability and learn about my culture	3	3

Activities		Number (n = 30)	%
Benefits from economic development (income, production, tourism, etc.)			
D	Sharing of economic benefits from co-management activities was handled by local elites/FD/NSP/outsiders	11	37
P	I was consulted by the local elites/FD/NSP/other outside agencies regarding sharing of economic benefits from co-management activities	10	33
C	I was involved in dialogues with local elites/FD/NSP/outside agencies regarding sharing of economic benefits from co-management activities	-	-
E	Sharing of economic benefits from co-management activities was fully handled by local people	9	30
Legend: D = Domestication, P = Paternalism, C = Cooperation, E = Empowerment			

Participation in benefit-sharing phase: The indicators I used to measure the type of participation in benefit sharing included whether participants received benefits from natural resources, materials, social development, and/or economic development (see Table 6 above). The majority of the respondents (76%) perceived that they were passive participants in decisions about how benefits from natural resources were to be shared (domestication 63%, paternalism 13%). Similarly, 70% of participants felt that they were passive participants in deciding how material benefits were shared (paternalism 70%). Most respondents felt that decisions about how material benefits should be shared were decided by local elites and outsiders. A large majority of participants (77%) felt that decisions on how benefits from social development would be shared were made by elites and outsiders (domestication 40% and paternalism 37%). Likewise, 70% of participants felt that decisions about how benefits from economic development would be shared were also controlled by local elites and outsiders (domestication 37% and paternalism 33%).

In assessing the overall degree of participation of local communities in the planning process and co-management activities of CWS, it is evident that a large portion of participants perceived their participation to be passive as illustrated in Table 1 in the conceptual framework. During the two years since co-management was introduced, CWS and NSP officials have done little to encourage participation beyond the initial visits and meetings held in each community to inform them of co-management activities and the consultation meetings held in Chunati. These efforts, according to Table 1, can be categorized as passive participation, information giving, and limited consultation. As one Co-management Committee member in Chunati commented:

> Participation – there is a great lack of it here. It's that [the project officials] see it as something very technical – that you have to have a meeting to which you invite some local people to talk, and then you can 'tick it off', as if you've then done participation.

Although participatory terminology was incorporated into the project plans and the sanctuary's management plan, participation remained more a word on paper, rather than an actual practice. Table 7 summarizes the types of participation observed based on the phases of project activity. Passive participation dominated all four phases of co-management activity: 77% in planning, 70% in implementation, 77% in benefit sharing, and 83% in the evaluation phase. This indicates that local elites and the local government (management authority) still dominate co-management activities.

On the positive side, however, participants perceive that they have been actively involved in planning (23%), implementation (30%), benefit-sharing (23%) and project evaluation (17%). This is meaningful because co-management in CWS is still in an initial stage (i.e., in two years the levels of community participation have gone from zero to about a quarter). I also learned from respondents that their positive experiences might encourage them to become more involved in co-management activities. If this is the case, the existing mistrust, confrontation and conflicts between NSP and FD management, staff and local people regarding resource use and other incentives and benefits may be overcome. Co-management staff members should be loyal and transparent in selecting project beneficiaries and make decisions on the basis of priority.

Table 7: Summary of how respondents' assess their participation in phases of the project

Type of participation		Participants in different phases of project activity (N=30)			
		Planning	Implementation	Monitoring and Evaluation	Benefit-Sharing
Passive participation	Domestication (D)	14 (47%)	15 (50%)	25 (83%)	12 (40%)
	Paternalism (P)	9 (30%)	6 (20%)	-	11 (37%)
Active participation	Cooperation (C)	3 (10%)	1 (3%)	3 (10%)	-
	Empowerment (E)	4 (13%)	8 (27%)	2 (7%)	7 (23%)

Qualitative Results and Discussion

Dynamics of conflict in the area: All systems of social control have to deal with the fact that conflict may occur (Miller 2004). Conflict cases are evident in co-management activities in CWS. This is not happening for trivial reasons. The dependence of local people's livelihoods on forest resources has been found to be the most influential factor affecting non-conforming behavior to CWS management and regulations.

Almost all of the people who live in and around the sanctuary are very poor, have a low standard of living, have a low education level, and have been deprived of their livelihoods. Fuelwood and other forest products have become more and more difficult to obtain. Conditions such as these often lead to local people utilizing PAs to meet their immediate needs in unsustainable ways.

Conflicts among local people and CWS have been simple and at a level that has not become destructive to the community. However, conflict has occurred in some activities and not in others, and in some groups but not in all groups. Levels of conflict among members of the community and the management authority were typical of the activities undertaken involving provision of monetary incentive benefits, use of forest resources (forest management), plantation management (e.g., rice, vegetables, etc.), and organizational management. Types of conflict that I observed during the study of co-management activities included inter-personal, within groups, and combinations of groups and management authority (e.g., when monetary incentives were distributed by NSP staff to inappropriate beneficiaries without prior consultation in the community meeting). Stoner and Wankel (1987) conclude that projects with moderate levels of conflict have far greater potential for desirable outcomes than projects with higher levels of conflict. With moderate conflict, the rival persons are more likely to learn to interact in constructive problem solving. Conflicts observed in co-management activities were generally more of an emotional type among the management authority of NSP, FD, and members seeking the same resources, activities, or goals.

Lack of effectiveness of the existing administration and management of the project: The management authority of the sanctuary is responsible for coordinating the activities performed by other departments having interests and targets in the protected area. These departments often act autonomously without the knowledge of the FD or the NSP. Unfortunately, the FD lacks the institutional ability to coordinate these departments. Institutional weaknesses at the national and regional levels of government has resulted in delays, inefficiency, lack of information, conflicts, and an inability to reach consensus – all of which has meant that little progress has been made in implementation. At the community level, the institutional weaknesses result in conflicts and confrontation, a general lack of rules, non-compliance with regulations on sustainable natural resource management and conservation, and a

lack of control against outside invaders. These, in turn, result in the continued extraction of increasingly scarce forest products at unsustainable rates using destructive methods, both by community members and outsiders.

Conclusions

The extent to which the local population shares in problem definition and participates in its identification is a prime factor affecting program success (Little 1994). Defining the problem not only means eliciting dialogue, but also means translating the problem (in this case the loss of biodiversity) into terms that have relevance for the local community. The case of CWS illustrates a clear lack of local community participation in the definition of environmental problems and priorities. The problem of biodiversity loss was raised by international and national conservationists and biologists and decisions regarding what, where and how to conserve biodiversity were made by external scientists with no participation, consultation or input from local inhabitants, despite the fact that local residents have the largest stake in, and much information about, natural resources in the area (Uphoff 1992).

In this study, I conducted an analysis of stakeholder participation and effective PA co-management planning in CWS. The study demonstrates that participation can not be conjured up or created artificially, as it is a feeling on the part of people and not simply an externally enforced mechanical act of being called into and take part in discussions. This calls for a fundamental shift in the approach to conservation and participation of local populations. Effective and active participation requires an effort from both external PA stakeholders and the local communities themselves.

The importance of the participation of local communities in conservation projects is now widely accepted within conservation circles and particularly within the growing areas of integrated rural development and natural resource management. Still, participation is not a one-size-fits-all principle. Instead, the levels and forms of participation vary depending on the management's involvement of local people, the stakeholders' ability and willingness to participate, and the kinds of projects and issues under consideration. As described earlier in this paper, the types of participation by stakeholders range from passive participation, in which people are simply told what is going to happen or has happened already, to active

participation, where people take responsibility for and actively contribute to project planning, design, and implementation (Arnstein 1967).

The results revealed that assessing the types of participation by local people in the co-management activities of NSP and their views produces useful information that can be incorporated into the decision-making process leading to resolution of conflicts. The findings indicate that local residents do not have extensive knowledge about the co-management objectives and benefits. Provision for a community information and support center by the management authority could help to expose local people to the objectives of the sanctuary's co-management activities and promote the management authority.

Table 1 demonstrates how the meaning of participation varies across projects. Often, communities who are affected by conservation projects are expected to change the way they use resources. Through this study I have come to the conclusion that, if communities are expected to change their resource use patterns and remain in support of NSP, they need to be engaged in decision making regarding the design, implementation, and monitoring of the project. It is true that not all projects necessarily require the most involved level of participation of project communities to be successful. However, community-based conservation projects like NSP in CWS are built upon the idea that local support and the genuinely active involvement of community members strengthens natural resource management efforts. Co-management committee and council members in CWS observed that the greater the change desired in resource users' behavior, the greater the level of community participation required.

Observations from CWS suggest that the time needed to facilitate a participatory process in biodiversity conservation and management must not be underestimated. The process may take much longer than a non-participatory approach, but this investment is essential for building mutual understanding, obtaining useful input and promoting local empowerment. Anthony Hall (1997) emphasizes the importance of timing when involving communities in projects, stating that communities should become involved early on in the project, when the conservation strategy is first being conceived, and before any major decisions have been taken or basic parameters set (Hall 1997). The main partners in conservation – the local communities and field staff – need to be empowered through training and capacity-

building programs. Flexibility in allocation of funding is needed at the planning stage. Intensive communication efforts using a variety of mediums are necessary to raise conservation issue awareness in the villages, transfer technologies, build confidence in the participants, and create a spirit of collaboration among PA personnel and village people. By initiating a two-way exchange of ideas, all NSP stakeholder parties were able to more effectively communicate their environmental management goals and produce a balanced plan reflecting a diversity of interests (CEE 1997). Successful, people-oriented conservation projects must address the different resource priorities and requirements among the various sectors of a community. They must establish equitable partnerships so that all stakeholders have equal opportunities to control and manage resources and benefit from them.

The objectives of achieving economic benefits for inhabitants living in and near the sanctuary will only be possible if the management plans give considerable weight to livelihood development options in addition to the current focus on co-management. This study supports the idea that the conservation of protected landscapes depends upon maintaining a viable regional economy and having a local population that is sympathetic to the objectives of conservation. It means working with people at all levels, especially those living and working in the area – the people most intimately affected by what happens to it. As recommended in the Lake District Declaration (Foster 1988), local management officials should provide sufficient resources to implement sustainable development models and promote a worldwide exchange of information and experience on the management of such protected landscapes.

At the same time, it is important to note that there is no single view of PAs and how they should be designed and managed. Instead, there are contesting opinions based on different viewpoints and values. PAs have been established in different social contexts and environmental conditions, and it has been found that different areas require different approaches. An uninhabited virgin forest area will not call for the same approach to protection as an area with significant environmental degradation. Similarly, local people should not be viewed as a homogeneous group in which all the people share the same opinions and the same goals, but as individuals who have different perspectives and priorities that should be balanced. Protected area conservation efforts should include people instead of excluding them.

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Local Knowledge of Indicator Birds: Implications for Community-Based Ecological Monitoring in Teknaf Game Reserve

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Abstract

The Bangladesh Forest Department (FD)'s Nishorgo Support Project (NSP) has initiated an ecological monitoring program that observes the populations of eight indicator bird species to assess forest health. The selection of indicator birds was done based on scientific knowledge and did not consider the interest and knowledge of forest dwellers. Recognizing the need for involving forest dwellers in sustainable community-based ecological monitoring, this study explores local knowledge of indicator birds used for the ecological monitoring program at the Teknaf Game Reserve (TGR). Most local people could identify the Hill Myna, Oriental Pied Hornbill, Red Jungle Fowl, Greater Racket-tailed Drongo and Red-headed Trogon and knew their ecological value. Only members of the Chakma community living within the game reserve, however, could identify all eight birds, including the White-crested Laughing Thrush, Puff-throated (Spotted) Babbler and White-rumped Shama. This study's findings suggest that the usefulness of these birds as indicator species depends on the community that will be monitoring them. Among people living near or outside the game reserve, the more easily identifiable species are more useful. Among people living within the game reserve, all eight species are easily recognized.

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Introduction

Community-based monitoring has become popular among natural resource managers in many countries around the world. However, the incorporation of local ecological knowledge (LEK) into community-based monitoring has been difficult due to the ambiguity of the term and uncertainty amongst natural resource managers of how to integrate LEK into monitoring practices. The application of LEK in impact assessments and conservation monitoring has been more widely accepted within the scientific research community (Huntington 2000). Gilchrist (2005), referring to Johannes (1989), states that LEK is synonymous with "oral tradition", "indigenous knowledge", "local or community knowledge", or "traditional ecological knowledge". He also summarizes the LEK definition of others (e.g., Duerden and Kuhn 1998, Pierotti and Wildcat 2000) as "a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission". Huntington (2000) states that traditional ecological knowledge is the knowledge and insight acquired through extensive observation of an area or species, which is not only restricted to the indigenous people.

There is controversy about who were the first settlers in the region surrounding the Teknaf Game Reserve (TGR). Some people believe that the Chakma are the oldest ethnic group to have settled this area, arriving nearly 500 years ago (Bari and Dutta 2004). Others believe that Bengali Hindus, Buddhists and Muslim have been living in this region for the last 1,000 years (Bari and Dutta 2004). Regardless of the history of settlement, the fact remains that the livelihood of inhabitants living in and near TGR is deeply rooted in the reserve's natural resources. The LEK of these people has evolved with their livelihood, culture and interests and is a great source of information that needs to be recognized and properly utilized for the management of natural resources in this area.

Bangladesh's Forest Department (FD) currently seeks to involve local people in the management of TGR through the Nishorgo Support Project (NSP), a co-management project that aims to conserve the valuable biodiversity of the reserve. This project has started an ecological monitoring program similar to other conservation management projects worldwide. A group of scientists working for NSP determined eight indicator birds and a methodology for detecting changes in biodiversity due to management interventions. The scientists selected the indicator

birds on the basis of their scientific knowledge of the protected area and did not take into consideration local knowledge of the reserve's ecosystem. Failure to consider and incorporate local ecological knowledge will reduce the effectiveness of community-based ecological monitoring. This study aims to explore the knowledge of local people of the eight indicator birds used by NSP for ecological monitoring of TGR. It is hypothesized that differences exist among longtime local residents in terms of what they know about the ecology of the indicator birds. The ability of local people to identify these species may vary with respect to their age, gender, religion, profession, and ethnicity. In addition, the age of the village and its proximity to the forest may influence local knowledge about the ecology of the indicator birds. The main objectives of this study are: (a) to understand and document local knowledge and capacity of the forest dwellers to identify the indicator birds, (b) to understand local knowledge of the ecology of the indicator birds, and (c) to assess the scope for introducing community-based ecological monitoring into the co-management process. I believe that local perspectives on the eight NSP indicator birds will provide critical information for community-based ecological monitoring in the co-management process of the protected areas of Bangladesh.

Background

Teknaf Game Reserve is the only game reserve in Bangladesh, and is located at the extreme southeastern part of the country on the Teknaf Peninsula of Cox's Bazaar District, almost 600 km from Dhaka. The reserve is bounded by the Naf River to the east, the Bay of Bengal to the southwest, and the Thainkhali Reserve Forest of Ukhya Upazilla District to the north. TGR covers an area of 11,615 hectares and lies between $20^{o}52'$ – $21^{o}09'$ N latitude and $92^{o}08'$ – $92^{o}18'$ E longitude (Mollah *et al.* 2004, Rosario 1997). TGR was previously a reserve forest under the Forest Act 1927. Because of its importance for wildlife conservation, the area was declared a game reserve in 1983 under the Wildlife Act of 1973, which provided it with a different legal, managerial and institution status.

A total of 112 villages are located inside the reserve – some near the periphery and some deep within the forest. These villages range in age from approximately 50 to 150 years. The oldest villages were settled by members of the Rakhain and Chakma ethnic communities. Bengali Muslims, Buddhist Borua and some Hindu people

settled in the comparatively newer villages. The total population residing within the reserve is approximately 150,000 people, consisting of about 52% men and 48% women. Approximately 67% of the total population is adult (at least 18 years old), 12% are youth (9-17 years old), and 19% are children (8 years of age and younger) (Bari and Dutta 2004).

The forest of TGR falls under the tropical evergreen and semi-evergreen forest biogeographic zone. Four main habitat types (high forest, low forest, grasslands and water bodies) have been identified in TGR (FRA 2000). In addition to other wildlife species, there are about 286 species of birds in Teknaf Game Reserve (Aziz *et al.* 2004). Of these species, the following eight were selected as indicator birds by the TGR authorities for ecological monitoring:

1. Greater Racket-tailed Drongo (*Dicrurus paradiseus*)
2. Hill Myna (*Gracula religiosa*)
3. Oriental Pied Hornbill (*Anthracoceros albirostris*)
4. Red-headed Trogon (*Harpactes erythrocephalus*)
5. Red Jungle Fowl (*Gallus gallus*)
6. White-crested Laughing Thrush (*Garrulax leucolophus*)
7. Puff-throated (Spotted) Babbler (*Pellorneum ruficeps*)
8. White-rumped Shama (*Copsychus malabaricus*)

The FD and scientists working for NSP suggested that indicator birds be selected based on the following criteria: a) they are associated with a particular habitat (e.g., forest birds, wetland birds, and grassland birds) (Browder *et al.* 2002), (b) they have potential to demonstrate a cause-effect relationship because they are associated with particular structures within a habitat (i.e., upper, middle and lower canopies or shrub versus ground dwellers) (Canterbury *et al.* 2000), and (c) they are likely to be responsive within a relatively short time span to environmental impacts (Browder *et al.* 2002) (Aziz *et al.* 2004). In general, the indicator bird species are seasonal and colorful songbirds that are not uncommon and represent distinct structural components of the forest.

The FD and NSP had conventional scientific monitoring in mind when selecting indicator bird species. The interest of local people and their ecological knowledge was not taken into consideration when selecting the criteria for choosing the

indicator species. Science-based monitoring might not be sustainable at TGR because it requires people trained in specific skills to carry out monitoring. The FD and NSP considered involving amateur and professional ornithologists and bird watchers in monitoring indicator bird species, but this would result in the monitoring not being community-based.

Methods

Between February and June of 2007, I collected data by interviewing forest dwellers in different parts of the Teknaf Game Reserve. The respondents were members of forest user groups (FUGs) formed by the TGR authorities. An FUG is comprised of local inhabitants of the reserve and consists primarily of forest users. Of the one 100 FUGs in the reserve, I selected six FUGs from across the geographical spectrum. Of the six sampled FUGs, two were female FUGs and four were male FUGs. Ten people were interviewed from each FUG for a total of 60 people (20 female and 40 male respondents) (Table 1).

I used two interviewing techniques to better understand the LEK of forest dwellers about the indicator bird species selected by NSP. First, I conducted a structured interview (with questionnaire) to learn whether respondents could correctly identify the eight bird species. I showed individual respondents color photographs of the NSP indicator birds and asked them to not discuss what they had seen with other respondents. I then collected information about the age, gender, religion, and ethnicity of the respondents. The distance of the village from the main forest area was also recorded.

Second, I conducted key respondent interviews with four FUG members who were very knowledgeable on local birds to learn detailed ecological information on the NSP indicator species. I selected the key respondents based on their performance in the structured questionnaire interview. Key respondents were from the Bengali, Rakhain and Chakma ethnic groups and also represented the Muslim and Buddhist religious groups. I collected detailed information about the birds' characteristics according to local ecological knowledge (i.e., common habits and habitats, nesting and roosting behaviors, breeding patterns, ecological indicator values, religious and ethnic significance, and economic importance) and about the local name used by each ethnic group for each bird species.

Table 1: Demographic profile, village age & distance from the forest of the sampled forest user groups

Forest user group	Gender		Religion			Ethnicity			Age group			Distance from the forest(km)			
	Male	Female	Muslim	Hindu	Buddhist	Bengali	Chakma	Rakhain	Young (18 - 29 Years)	Middle (30 - 49 years)	Old (50 years to older)	0	0.5	1.5	3
Kerangtoli Female FUG	-	10	9	1	-	10	-	-	2	5	3			X	
Kerangtoli Male FUG	10	-	10	-	-	10	-	-	2	5	3			X	X
Baruapara Female FUG	-	10	-	4	6	10	-	-	2	4	4				X
Wingchipru Male FUG	10	-	10	-	-	10	-	-	3	6	1				X
Domdomia Male FUG	10	-	6	-	4	6	-	4	2	5	3		X		
Horikhola Male FUG	10	-	-	-	10	-	10	-	3	4	3	X			
Total	40	20	35	5	20	46	10	4	14	29	17	1	1	2	2

Results

Bird identification by demographic profile

Gender. Table 1 shows the results from the sixty people I interviewed from six FUGs. Overall, I asked 40 male and 20 female respondents to identify the eight indicator birds (Table 1).

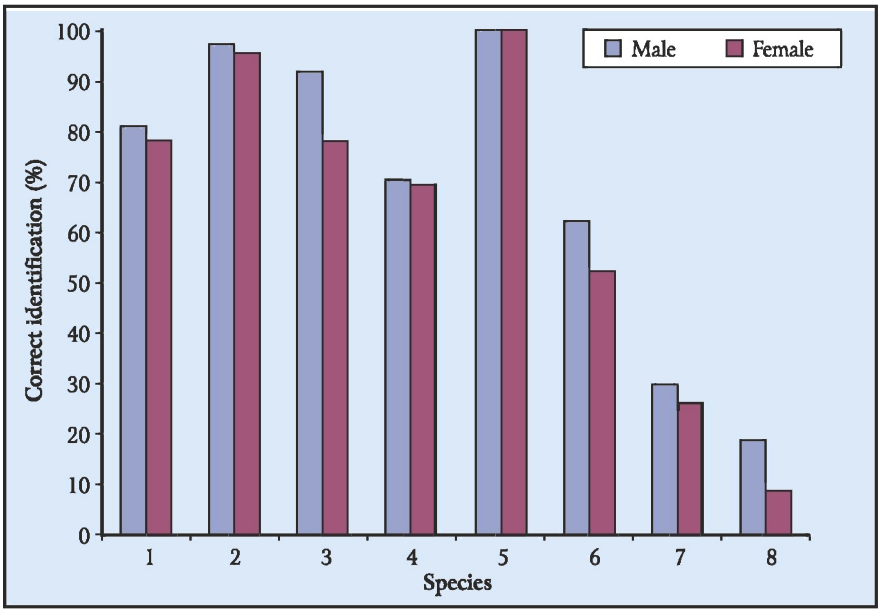

Figure 1: Correct identification of indicator birds by gender

Key: 1 = Greater Racket-tailed Drongo, 2 = Hill Myna, 3 = Oriental Pied Hornbill, 4 = Red-headed Trogon, 5 = Red Jungle Fowl, 6 = White-crested Laughing Thrush, 7 = Puff-throated (Spotted) Babbler, 8 = White-rumped Shama

This study revealed that most male and female respondents were capable of identifying six out of the eight indicator birds. Interviewees could also provide correct ecological information about these birds. Both men and women had less knowledge about the Puff-throated Babbler and White-rumped Shama (Figure 1).

Religion. I interviewed a total of thirty-five Muslims, five Hindus and twenty Buddhists among the sixty respondents in the reserve (Table 1).

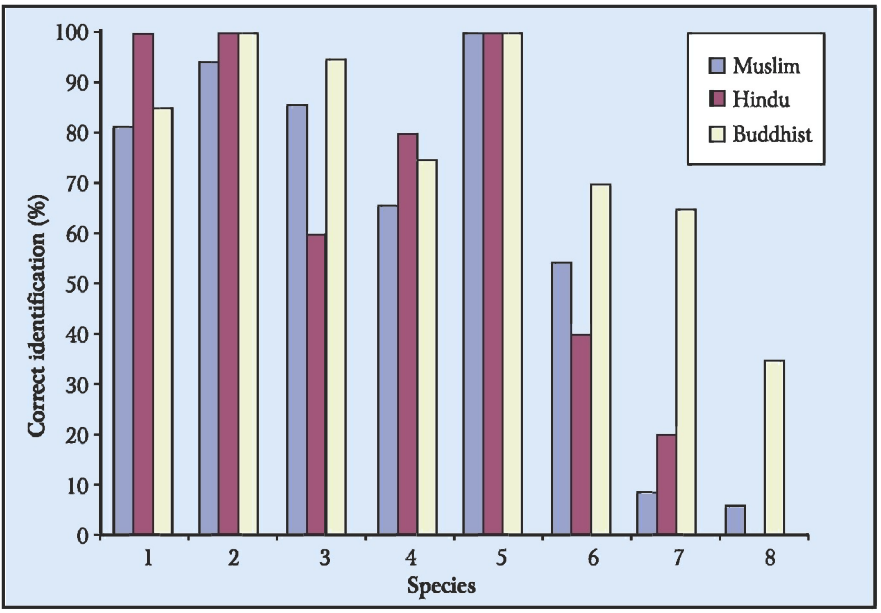

Figure 2: Correct identification of indicator birds by religion

Key: 1 = Greater Racket-tailed Drongo, 2 = Hill Myna, 3 = Oriental Pied Hornbill, 4 = Red-headed Trogon, 5 = Red Jungle Fowl, 6 = White-crested Laughing Thrush, 7 = Puff-throated (Spotted) Babbler, 8 = White-rumped Shama

Figure 2 shows that, in general, the Buddhists were more knowledgeable than the Muslims and Hindus about the indicator birds. Members of the Buddhist community could identify all eight species while members of the Muslim and Hindu communities could only readily identify the five species known by most locals (Greater Racket-tailed Drongo, Hill Myna, Oriental Pied Hornbill, Red-headed Trogon, and Red Jungle Fowl). The majority of interviewees from the Muslim community could also identify the White-crested Laughing Thrush.

Ethnicity. In the interview, there were forty-six Bengali, ten Chakma and four Rakhain respondents (Table 1). Figure 3 shows that members of the Chakma community in the reserve are knowledgeable about all eight of the indicator bird species and have comparatively greater knowledge of these species than the other two ethnic groups. Members of the Rakhain community did not identify all eight species as well as members of the Chakma community, but still a majority of the

Rakhain respondents correctly identified all of the birds. The Bengali respondents had poor knowledge about the Puff-throated Babbler and the White-rumped Shama, but the majority of Bengali respondents were still able to identify six species correctly. In general, members of the Bengali community had less ecological knowledge about these birds. This is most likely because their communities are located further from the reserve.

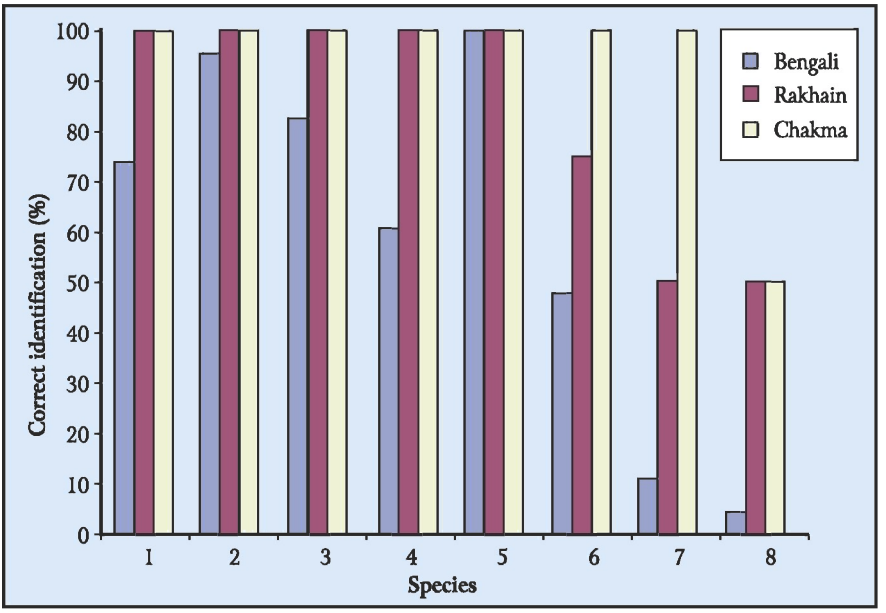

Figure 3: Correct identification of indicator birds by ethnicity

Key: 1 = Greater Racket-tailed Drongo, 2 = Hill Myna, 3 = Oriental Pied Hornbill, 4 = Red-headed Trogon, 5 = Red Jungle Fowl, 6 = White-crested Laughing Thrush, 7 = Puff-throated (Spotted) Babbler, 8 = White-rumped Shama

Age. I categorized the sixty interviewees into three age groups: young, medium and old. The young group was composed of people between the ages of 18 and 29 years, the medium group of interviewees was between 30 and 49 years old, and the older group was 50 years old and older. Of the 60 interviewees, I interviewed 14, 29 and 17 people from the young, medium and old age groups respectively (Table 1).

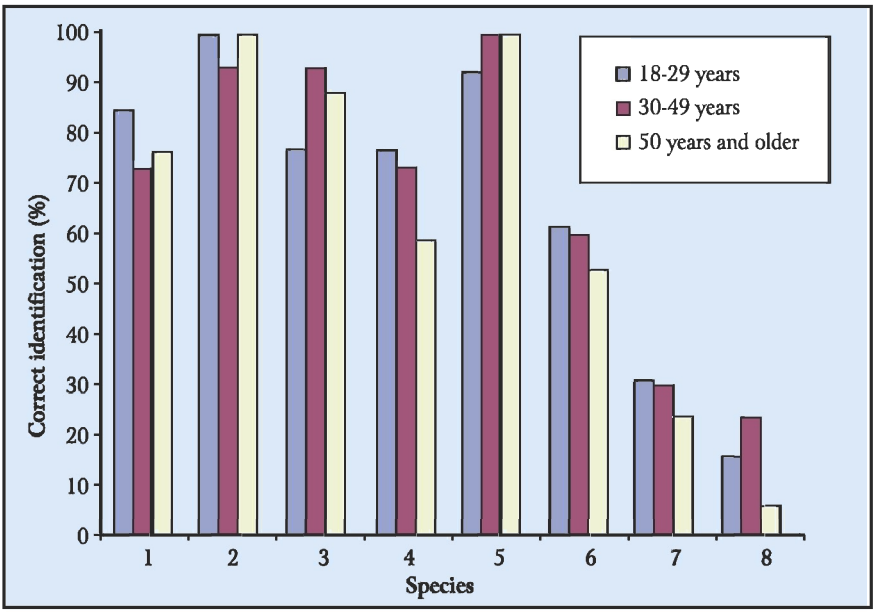

Figure 4: Correct identification of indicator birds by age group

Key: 1 = Greater Racket-tailed Drongo, 2 = Hill Myna, 3 = Oriental Pied Hornbill, 4 = Red-headed Trogon, 5 = Red Jungle Fowl, 6 = White-crested Laughing Thrush, 7 = Puff-throated (Spotted) Babbler, 8 = White-rumped Shama

Figure 4 shows that people of different age classes have more or less similar knowledge of the eight indicator birds. The majority of respondents in all age brackets could correctly identify Greater Racket-tailed Drongo, Hill Myna, Oriental Pied Hornbill, Red-headed Trogon, Red Jungle Fowl, and White-crested Laughing Thrush. Most respondents could not identify the Puff-throated (Spotted) Babbler and the White-rumped Shama.

Distance from the forest. Of the six sampled FUGs, one was located within the forest, another was located 0.5 km away from the forest, two were located 1.5 km from the forest, and the remaining two were located 3 km away from the forest (Table 1).

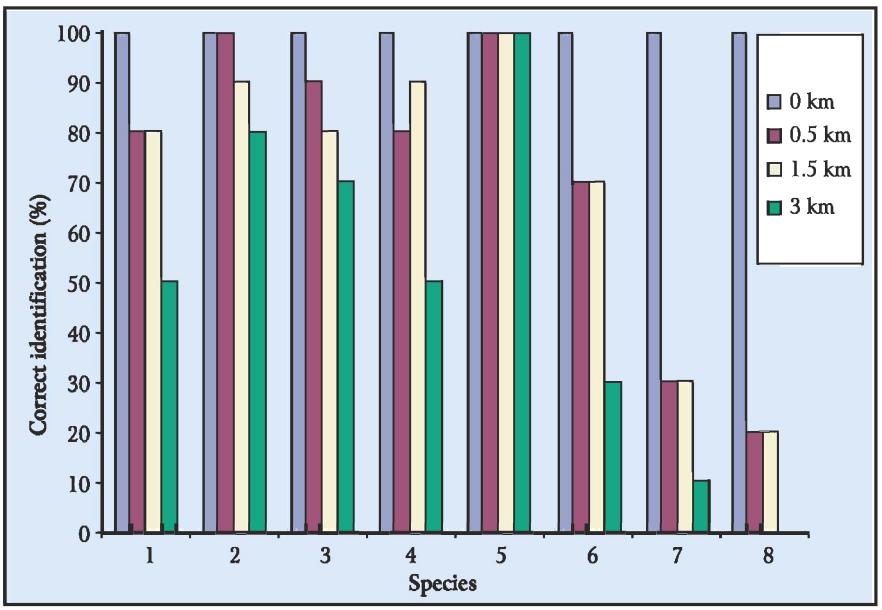

Figure 5: Correct identification of indicator birds by distance of village from forest

Key: 1 = Greater Racket-tailed Drongo, 2 = Hill Myna, 3 = Oriental Pied Hornbill, 4 = Red-headed Trogon, 5 = Red Jungle Fowl, 6 = White-crested Laughing Thrush, 7 = Puff-throated (Spotted) Babbler, 8 = White-rumped Shama

The results revealed that 100% of the respondents that lived in the forest could identify all eight of the bird species correctly. The ability of respondents to correctly identify the birds decreased with the distance they lived from the forest. The majority of respondents were able to identify the Greater Racket-tailed Drongo, Hill Myna, Oriental Pied Hornbill, Red-headed Trogon and Red Jungle Fowl. People living away from the forest were less able to identify the White-crested Laughing Thrush, Puff-throated Babbler and the White-rumped Shama (Figure 5).

Demographic factors. I anticipated that some of the demographic factors affecting LEK would have an association with each other. There is a clear association between ethnicity and religion. All members of the Chakma and Rakhain communities are Buddhist (Table 1). There is also a high association between ethnicity/religion and distance from the forest. Ten of the Chakma respondents live in the forest and the four Rakhain respondents live 0.5 km from the forest

(Table 1). In general, we can say that respondents from the Chakma Buddhist community who live within the forest (10 interviewees) have the best understanding of the indicator bird species. Members of the Rakhain Buddhist community who live 0.5 km from the forest (four interviewees) also have good knowledge of these birds. The Bengali respondents come from all three religions, live 1.5 to 3 km from the forests, and have the most diverse levels of knowledge of the bird species but their overall knowledge of these birds is not as good as that of the Chakma and Rakhain Buddhist communities who live in or closer to the forest.

Local ecological knowledge about indicator birds in the reserve

This section summarizes local ecological knowledge about the indicator bird species and explores which species are better known and why. Information from the key respondents about the indicator birds is presented in Boxes 1-8.

Red Jungle Fowl *(Gallus gallus)*

The results from structured interviews reveal that the Red Jungle Fowl is the most common and well-known bird in local communities. Most people from different age groups, religions, and ethnicities as well as from different locations within and near the forest know this bird. Local people are knowledgeable about the Red Jungle Fowl's food, nesting and breeding season. One of the main reasons people are knowledgeable about this bird is that it is a popular game bird. Some local people reported that the Red Jungle Fowl is indicative of rich undergrowth in the lower canopy of the forest. This bird can be a practical indicator for community-based ecological monitoring because it provides useful information about the condition of the lower strata of the forest and is well known among local people.

Box 1: Local ecological knowledge of the Red Jungle Fowl

The Red Jungle Fowl is known as *Shikari Kura*, *Jar Kura* and *Tosero* to the Bengali, Chakama and Rakhain communities respectively. Key respondents report that the male Red Jungle Fowl has an upper plumage of russet-gold and lower plumage of red and deep green. The female jungle fowl has puffed upper plumage and russet in their lower plumage. These birds prefer living in the dense undergrowth and bamboo groves of the semi-evergreen tropical forest. They are also found in forest gaps and edges and on agricultural lands close to forests. Local people report that this bird builds nests in the bushes of the densely covered forest floor and that the breeding season is from March-June (*Choitro-Ashar* in the Bengali calendar) when the birds lay eggs and the nestlings hatch.

Photo: NSP 2006

Results from the questionnaire show that the Hill Myna (*Gracula religiosa*) is well known among people of different genders, age groups, religions and ethnicities. This bird is also easily found in all of the focal villages and is the second best known of the indicator species. This bird's food preferences, breeding season, and nesting habits are also known to most people. The bird's unique ability to mimic the voice of animals – including human beings – is the main reason why it is so well known. Because of this special attribute, this bird has become an attractive pet, which has led to illegal trapping and selling of the species. Many forest dwellers in this area maintain their livelihood by capturing and selling these birds.

Local people suggest this bird is a useful indicator species for ecological monitoring because it is indicative of old and tall trees and rich middle strata in the forest. People also reported that the Hill Myna serves as an important propagator for seeds of trees valuable to wildlife. Because of people's interest in this bird and its ecological significance, the Hill Myna makes a useful indicator species for participatory ecological monitoring.

Box 2: Local ecological knowledge of the Hill Myna

Locally this bird is known as *Paliga* in the Rakhain community and *Shayer* in the Bengali and Chakma communities. The word "shayer" in Bengali means, "talking bird". This is a medium size bird with black, green and violet shimmering plumage. The orange colored bill and yellowish skin beneath and next to their eyes are identifying characteristics to local people. Key informants report that forest with tall trees and dense middle and lower strata are the preferred habitat of this bird. They also report that this bird builds nest in the cavities of trees made by other animals, especially in older trees with softer wood such as Shimul (*Bombax spp.*) and Koroi (*Albizia spp.*), and they usually roost in a flock in the middle strata of the forest. Various fruits such as Dumur (*Ficus spp.*), Jam (*Syzygium spp.*) and banana are their main food and they occasionally eat insects. According to local people, the Hill Myna's breeding season falls between March and July (Choitro-Ashar). In recent years local people have rarely observed this bird.

Photo: NSP 2006

Oriental Pied Hornbill (*Anthracoceros albirostris*)

Survey results reveal that the Oriental Pied Hornbill is another locally well-known bird that most people of different genders, religions, ethnicities and age groups can identify correctly. People are knowledgeable about the bird's food preferences, nesting habits, and breeding season. This bird is well known among interviewees living at various distances from the forest and from village settlements of different ages. The bird's spectacular bill, unique color combination, and harsh voice are reasons that people are more familiar with it. Moreover, this is an important game bird as it is thought to have significant medicinal value. An oil can be extracted from the bird's bill after it is cooked and used as a pain reliever. Many people also eat the meat of this bird to get rid of chronic bone and muscle pain. Local people report that the bird propagates seeds of trees that are valuable to wildlife. The bird

also indicates the presence of tall trees and a dense middle stratum in the forest. Considering people's interest in the Oriental Pied Hornbill and its ecological significance, this bird could be a useful indicator for participatory ecological monitoring.

Box 3: Local ecological knowledge of the Oriental Pied Hornbill

Locally this bird is known as *Resulla* or *Kao Dhonesh* to the Bengali, as *Keguiya* among the Chakma, and as *Aoshao* among the Rakhain. This is a well-known and popular bird among the people in and around Teknaf Game Reserve. However, local people report that this bird is rarely seen in the forest nowadays. Key respondents described the bird as having a black neck and back, wings with pale blue orbital skin, and a white belly and wingtips. These birds are arboreal in nature and usually build their nest in holes of tall trees of semi-evergreen forest such as *Garjan* and *Jam*. Local people report that females plaster themselves in their nest with mud and remain inside this nest during the whole period from egg-laying until the nestlings are able to fly. The female birds and nestlings are fed by the male bird during this period. They roost in pairs in trees in the middle strata of forests where they cannot be easily seen. The breeding season of this bird is between April and August (*Boishak–Shrabon*). On rare occasions, the predation of eggs and nestlings was reported by local people. Fruits of trees such as *Dumur* (*Ficus* spp.), *Bot* (*Ficus* spp.), *Dewa* (*Artocarpus* spp.), and *Bottaa* (*Artocarpus* spp.) are these birds' main food.

Photo: NSP 2006

Greater Racket-tailed Drongo (*Dicrurus paradiseus*)

Results from the structured interviews revealed that the Greater Racket-tailed Drongo is quite common and well known to local people of different genders, age groups, ethnicities and religions. This beneficial bird is known by people because it

destroys some insects that are harmful to crops. Moreover, the bold and noisy nature of this bird makes it easily recognizable. However, this bird is less known to people living further away from Teknaf Game Reserve in comparison to those people living inside the forest (Figure 5). The reason behind this trend might be that there are fewer tall trees for roosting in the villages away from the forest. The Greater Racket-tailed Drongo is also less known to people living further from the forest because it is not a bird that is hunted nor does it have any direct economic value to local people.

Box 4: Local ecological knowledge of the Greater Racket-tailed Drongo

Photo: NSP 2006

Locally, this indicator bird is known as *Viraj* (as well as *Vimraaj* and *Vingraj*) to the Bengali and as *Howatua* to the Rakhain. Key respon dents report that this bird's common roosting habitat is in the upper to middle canopy of semi-evergreen tropical forests along the forest edge. The bird is arboreal in nature and builds a cup-shaped nest by loosely intertwining dry twigs in the branches of tall forest trees found in the middle strata of the forest. The Greater Racket-tailed Drongo typically breeds, lays eggs, and has hatchlings between March and July (Choitro – Aahar). They usually lay three eggs in a clutch and both parents incubate and feed the young. The color of the egg is off-white with tinted brown spots. Various kinds of flying insects are their favorite food, including those harmful to crops. According to local people, this species is a good indicator of forest quality because the birds are often found in areas with tall trees near gaps in the forest canopy.

Red-headed Trogon (*Harpactes erythrocephalus*)

Interview results suggest that this bird is not as well known among local people as the birds discussed above. Nonetheless, local people report that the presence of this bird in the forest indicates a rich forest floor cover with dense vegetation and thick

litter. People do not know this bird as well because they do not receive any direct economic benefits from it. This bird is a good indicator of improving lower and middle strata of the forest. If used as an indicator species, information should be collected from communities that live deep in the forests, as they are more knowledgeable about its existence. Otherwise this bird may not be a suitable indicator species for community-based monitoring because local people that live near (but not within) the forests are not familiar with it.

Box 5: Local ecological knowledge of the Red-headed Trogon

This bird is locally known as *Kol* to the Bengali, *Vatoi Pait* to the Chakma, and *Gaog* among the Rakhain. As reported by the key respondents, Trogons have soft, often colorful, feathers with distinctive male and female plumage and a long and broad square-cut tail. Local people also reported that Red-headed Trogons prefer to build nests in the tree holes of the dense middle strata of the forests and to roost alone in these same areas. Insects from the forest floor provide the majority of their food. Their breeding period is from March to June (Choitro - Ashar).

Photo: NSP 2006

The Laughing Thrush is not easily recognizable to local people. However, this bird is quite well known to the Chakma community who live inside the forest, and they were able to identify this bird and give accurate information about its breeding season, diet and nesting behavior (Figure 9). Although no economic importance of this bird has been reported, the bird has ecological significance as an indicator of rich forest floor cover with full forest litter. This bird also plays an important role in decomposing the forest litter because it turns the litter when searching for insects. Considering the ecological significance of the White-crested Laughing Thrush, it has the potential to be a useful indicator species. Its usefulness, however, will be limited at TGR to members of the Chakma community, as only they are knowledgeable of the bird and its habits.

Box 6: Local ecological knowledge of the White-crested Laughing Thrush

The Bengali know this bird as *Pata Urali*, meaning the bird who removes the litter from the forest floor to find insects. The Chakma call it *Shota Pait* and the Rakhain refer to it as *Sagong Grl*. Local people report that this small bird has an erect crest on its white head, a white throat and breast, and black mask-like markings on its head. It also has a floppy tail with soft fluffy plumage. This bird is occasionally seen picking out insects from the forest litter below large trees where lots of litter is deposited. They roost in the forest's middle strata in a flock moving from one place to another. This species builds small nests in the forest's middle strata and breeds between March and July (Choitro – Shrabon). Locals report that these birds lay three to four eggs.

Photo: NSP 2006

Puffed-throated (Spotted) Babbler (*Pellorneum ruficeps*)

These birds have a chestnut crown, long buff supercilium and dusty cheeks (Ali and Ripley 1987, Hossain 1979). Survey results suggest that this bird is less common and not as well known to the people of TGR. Most people of different genders, religions, and age groups were unable to identify this bird and were not knowledgeable about its breeding season, nesting habits and food preferences. However, this bird is well known to members of the Chakma community who live deep inside the forest. Local people report that the bird is an indicator of scrub forest but that it has no known economic value. This bird is not a good indicator species for community-based ecological monitoring because it does not have any significant ecological or economic value for local people and it is not easily recognizable.

Box 7: Local ecological knowledge of the Puffed-throated (Spotted) Babbler

The Bengali and Chakma people do not have a local name for the Puffed-throated Babbler. In the Rakhain community it is known as *Pyanshi*. Key respondents report that these birds are commonly found in a flock in the low bush or bamboo groves of scrub forests. They describe the bird as plain brown above and white heavily streaked with brown below.

Photo: NSP 2006

White-rumped Shama (*Copsychus malabaricus*)

The White-rumped Shama is less well known to the people in TGR. Most people of different genders, religions, and age groups were unable to identify this bird and were not knowledgeable about its breeding season, nesting habits and food preferences. This species is, however, well known to members of the Chakma community who live deep inside the forest. People report that the bird is an indicator of scrub forest and that it has no known economic value. This bird is not a preferred indicator species for community-based ecological monitoring because it does not have any significant ecological or economic value for local people.

Box 8: Local ecological knowledge of the White-rumped Shama

In Bengali this bird is known as *Shama*. In the Rakhain and Chakma communities, this bird is known as *Sobehlao* and *Turing* respectively. Key respondents report that these birds are commonly found in a flock in the low bush or bamboo groves along hill streams. These birds build nests in the dense bushes along the streams of TGR.

Photo: NSP 2006

Conclusion

This case study explored the local ecological knowledge of forest dwellers about eight birds being used as indicator species by the TGR for ecological monitoring. The study found that local people of different genders, religions, ethnicities and ages are knowledgeable of most of the selected indicator bird species. The evolution of LEK about indicator birds in TGR appears to be mainly driven by the value of the birds as game. Some forest dwellers were also aware of the ecological value of these birds. Nonetheless, ecological value does not seem to be an important factor for identifying these birds. Selecting indicator species based solely on ecological values and a scientific point of view might not be the best strategy for community-based ecological monitoring.

This study suggests that the Hill Myna, Oriental Pied Hornbill, Red Jungle Fowl and Greater Racket-Tailed Drongo are the most suitable indicator birds for community-based ecological monitoring because they are well known to local people for their game value as well as for their ecological value. This study also suggests that the White-crested Laughing Thrush, Puff-throated (Spotted) Babbler and the White-rumped Shama are less suitable indicator birds for community-based monitoring by the Bengali forest dwellers living at the periphery of TGR. However, these birds are rather suitable indicator birds to the Chakma forest dwellers, living deep inside the forest area of TGR for community-based monitoring. These findings provide important information for park managers designing and introducing long-term community-based ecological monitoring.

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Co-management of Protected Areas Without Local Knowledge and Participation: A Case Study of Lawachara National Park

Mohammad Abdul Aziz[1]

Abstract

The limited success of traditional protected area management by Bangladesh's Forest Department led policy makers to develop the Nishorgo Support Project (NSP), utilizing a co-management conservation approach involving local people. However, the co-management plans developed for Lawachara National Park, one of NSP's five co-management pilot sites, did not emphasize the importance of local knowledge, or try to involve residents who are particularly knowledgeable about local biodiversity. This study assesses local knowledge and perceptions of biodiversity issues among members of specific co-management institutions, and among local people who do not belong to these bodies. The study considers how local knowledge is incorporated into park management. The findings reveal that the current Co-management Council and Committee members possess a poorer understanding of biodiversity than many members of the local community. However, local people's participation in decision-making through these bodies was found to be very low, and strongly influenced by local elite members. Their lack of participation can be attributed to the fact that consideration of their critical dependence on forest resources and their day-to-day needs has been largely excluded from the Council and Committee formation process. This case study suggests that policy-makers and protected area managers need to recognize the importance of local knowledge of biodiversity issues, and ensure the representation of local people in the process of co-management of protected areas. Local participation in decision-making can facilitate the sharing of local knowledge, which can in turn help formulate feasible management and conservation plans to ensure the long-term protection of Lawachara National Park and other protected areas of Bangladesh.

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Introduction

The importance of local knowledge for protected area management, conservation and sustainable use of natural resources has been widely acknowledged. The terms 'local' and 'indigenous' knowledge refer to bodies of knowledge, know-how and practices that are maintained and developed by communities or peoples with long histories of close association with natural systems. These sets of understandings, interpretations and meanings are part of cultural systems: natural resource use practices, rituals, spirituality, beliefs or myths of a people or community. Such knowledge provides the basis for local decision-making about a range of activities, such as hunting, gathering, fishing, agriculture, animal husbandry, food production, water collection, healthcare (medicinal plants), and adaptation to environmental or social change.

Scientists and resource managers acknowledge that much of the world's biodiversity has been in the hands of local peoples, societies, agriculturists and herders for several millennia. Pre-scientific, traditional systems of management have been the main means by which societies have managed natural resources (Berkes 1989; Gadgil, Berkes and Folke 1993). Local or traditional knowledge represents the summation of ecological adaptation of human societies to their diverse environments. This knowledge can help design more effective conservation for biodiversity and ecosystems in general (Berkes, Folke and Gadgil 1995). Many people who have been living in and around forest areas have had a long relationship with natural resources and their management (Rao, Maikhuri and Saxena 2003, Sekhar 2003, Ahmed 2004). Hence, the involvement of people with local knowledge on biodiversity issues in the co-management of protected areas (PAs) can be crucial to realizing their sustainable management.

In Bangladesh, more than fifty-percent of the forest cover has disappeared in the last thirty years. Presently, the Forest Department manages seventeen official PAs covering an area of 241,675 hectares. These natural areas include eight national parks, eight wildlife sanctuaries and one game reserve. Since the declaration and establishment of PAs in Bangladesh under the provisions of the Bangladesh Wildlife (Preservation) (Amendment) Act of 1974, the Forest Department has been considered the custodian of the forests of Bangladesh. However, the department has often excluded local people from the park, taking the view that human

activities are detrimental and incompatible with ecosystem conservation. Consequently, their management practices have produced very limited success and have resulted in further environmental degradation and destruction within PAs.

In 2004, the Forest Department of Bangladesh initiated the Nishorgo Support Project (NSP). The co-management structure developed for Lawachara National Park (LNP) involved local people from different strata by creating a Co-management Council (hereafter referred to as "Council") and a Co-management Committee (hereafter referred to as "Committee"). There are fifty members in the Council and nineteen in the Committee, including nine different categories of people living in and around Lawachara National Park.

This paper assesses local knowledge about biodiversity and how this knowledge is being incorporated into the management of Lawachara National Park. It seeks to inform policy makers, practitioners and PA managers about the necessity of incorporating the knowledge of local people into the process of co-management of this and other PAs.

Background

A protected area is "an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and naturally associated cultural resources, and managed through legal or other effective means" (IUCN 1993). Presently, less than eight percent of Bangladesh is under forest cover (IUCN Bangladesh 2000). The Forest Department manages 1.53 million hectares of forest land, mainly under the categories of 'reserved forest' and 'protected forest'. The Bangladesh Wildlife (Preservation) (Amendment) Act (1974) defines a national park as a "comparatively large area of outstanding scenic and natural beauty with the primary objective of protection and preservation of scenery, flora and fauna in the natural state, to which access for public recreation and education and research may be allowed." Bangladesh's national parks harbor rich biodiversity, including at least 107 plant species (Leech and Ali 1997).

Lawachara National Park was established in 1996 and is located between 24°30' N and 24°32' N longitude, and between 91°37' E and 91°39' E latitude. The park was previously part of the West Bhanugach Reserve Forest, which was planted in the 1950s. It is situated about eight kilometers northeast of the Kamalgonj Police

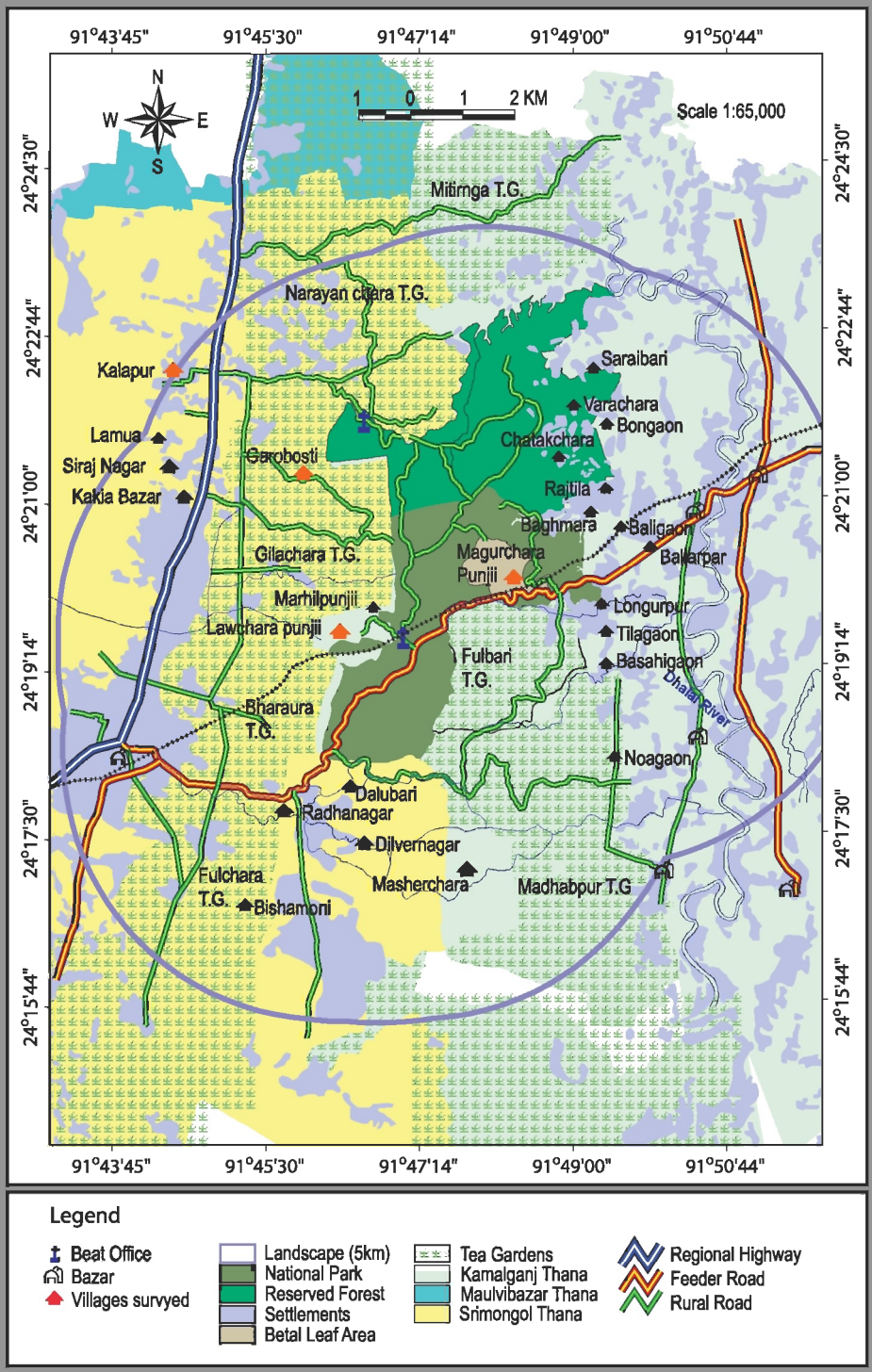

Figure 1: Lawachara National Park with the two study villages indicated

Station under Moulvi Bazaar Forest Range, Sylhet Forest Division. The park covers 1,531 hectares, including 281 hectares proposed to be added by the Forestry Sector Project Management Plan (FSP 2000). It is bordered on the north, west, south and southeastern sides by seven tea estates, which provide homes for a large number of tea laborers and their dependents. These people frequently enter the park to collect forest resources.

The topography of the area is undulating, with slopes and hillocks ranging from ten to fifty meters, along with numerous streams flowing through the park. The soil of the park is comprised of brown, sandy clay loam to clay loam of Pliocene origin (Hossain *et al.* 1989). Local people use numerous trails for collecting fuelwood and transporting agricultural crops. The forests are currently of a semi-evergreen type, and originally supported an indigenous vegetation of mixed tropical evergreen forest. The average tree density of the park is 271 trees per hectare with an average species density of 11.2 species per hectare. *Tectona grandis* (teak) is the most common species along with *Artocarpus chaplasha*, *Ficus gibbosa*, and *Gmelina arborea* (Feeroz 1999). The diversity and density of wildlife species in the park is also very rich, including 11 species of amphibians, 24 species of reptiles, 230 species of birds, and 42 species of mammals (Feeroz 1999, Aziz 2007). Among the notable wildlife found in the park are the painted bullfrog, tree frog, green pit viper, common vine snake, ornate flying snake, rock python, Oriental Pied Hornbill, Greater Racket-tailed Drongo, Red-headed Trogon, Black-rumped Shama, Emerald Dove, Neck-laced Laughing Thrush, Yellow-footed Green Pigeon, hoolock gibbon, Phayre's leaf monkey, pig-tailed macaque, capped langur, rhesus macaque, slow loris, hoary-bellied squirrel, and orange-bellied Himalayan squirrel. Table 1 presents a summary of the basic physical and demographic characteristics associated with Lawachara National Park.

In terms of administration, Lawachara National Park is served by the Council and the Committee, made up of 19 and 50 members, respectively, and consisting of resource owners, forest officials, local government employees, law enforcement officers, and representatives of various civil society groups. The role of these two co-management bodies is to prepare management plans, make decisions, and imple-ment action plans for the long-term conservation of the national park and the sustainable use of local natural resources. However, the level of interest and knowl-edge about biodiversity among those involved in this management approach

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- What knowledge and perceptions of biodiversity do local villagers have, compared to the people appointed to the Council and the Committee?
- How do local people participate in decision-making in the co-management initiatives developed for park management and conservation?

Methodology

From February to June 2007, I interviewed people from two villages, as well as members of the Council and Committee, forestry officials, key informants, forest user group (FUG) members, and people not belonging to FUGs. I conducted 26 in-depth qualitative interviews and four key-informant interviews. I also observed four Council/Committee meetings (Plate 1), and consulted Council and Committee meeting minutes as secondary data.

I selected the two village sites, Garo Bosti and Kalapur, in order to assess local knowledge and perceptions of biodiversity issues for this case study. These villages

were selected on the basis of their location, community type, dependence on local natural resources, and degree of access to the park. Garo Bosti is an ethnic Garo village located adjacent to the northeast corner of the park (Plate 2) while Kalapur is a Bengali village located about 100 meters away from the northwest corner of the park. People of both villages depend on the forests for their livelihoods on a daily basis. According to local people, the Forest Department settled the Garo Bosti community in the park around 1972 to assist their personnel with forest management. Kalapur has been located in the same place for as long as people can recall. A brief summary of key characteristics of the two study villages is provided in Table-2.

Table 2: Summary characteristics of the study villages

Characteristics	Garo Bosti	Kalapur
Number of households	58	460
Total population	280	2400
Distance from the park	Adjacent to the park	About 100m away from the park
Location	Northeast corner of the park	Northwest corner of the park
Primary ethnicity	Garo	Bengali
Dependency on forests	High	Moderate to high

Source: NSP field officer personal communication 2007

After preparing stakeholder profiles, I randomly selected three individuals from each village who were members of a NSP-formed forest user group, and three who were not. I carried out in-depth interviews with these individuals to seek their knowledge and perceptions on biodiversity issues. I interviewed the eldest member from each household. I also interviewed one key informant from each village and two key informants from another two villages (Lawachara Punji and Magurchara Punji) located within the park to record their in-depth knowledge on biodiversity issues, the status of some wildlife and plant species, and problems associated with park management and conservation. Selection of key informants from villages inside and outside of the forest allowed for comparisons and verification of this information. After preparing household profiles of each village, I identified and

selected key informants on the basis of their age, profession, degree of association with the forest, and the type of community they belong to.

I selected six members from the Council and Committee based on ethnicity and gender. I also interviewed two forestry officials involved in the Committee and Council, respectively, and consulted past meeting minutes of the Council (six meetings held between September 2005 and April 2007) and Committee (eight meetings held between March 2006 and March 2007) for data on participation, decision-making, and biodiversity. Summaries of interviewees' characteristics and question topics are presented in Table 3 and Appendix 1, respectively.

Table 3: Characteristics of respondents in the study

Reference groups	No. of HHs or people	People interviewed					
		Percent sampled	FUG members	FUG non-members	FD officials	Key informants	Ratio of men to women
Kalapur	460	1.5	3	3	--	1	4:3
Garo Bosti	58	12.1	3	3	--	1	5:2
Lawacharapunji & Magurcharapunji	64 (23, 41)	--	--	--	--	2	2:0
Council	50	14.0	2	4	1	--	5:2
Committee	19	36.9	3	3	1	--	6:1

I showed the informants photographs of four wildlife species (see Box 1) to assess their knowledge, beliefs, and perceptions. These wildlife species were selected from four classes (Amphibia, Reptilia, Aves, and Mammalia) on the basis of their threatened status under the IUCN Red List (IUCN Bangladesh 2000), their extent of distribution, their conservation significance (keystone species, indicator species, etc.) and their level of visibility to local people.

Box 1: Characteristics of selected key wildlife species used in the interviews

English name: -------- Hoolock gibbon
Scientific name: ------ *Hoolock hoolock*
Local name: ---------- Ulluk
Habits: ---------- Highly territorial, arboreal and frugivore
Habitat: ---------- Mixed evergreen forests
Status: ---------- Critically endangered
Threats: ---------- Habitat loss
Conservation needs: - Habitat protection and awareness

English name: -------- Oriental Pied Hornbill
Scientific name: ------ *Anthracoceros albirostris*
Local name: ---------- Kao dhanesh
Habits: ---------- Arboreal and mainly frugivore
Habitat: ---------- Mixed evergreen forests
Status: ---------- Endangered
Threats: ---------- Habitat loss and hunting
Conservation needs: - Habitat protection and awareness

English name: -------- Rock python
Scientific name: ------ *Python molurus*
Local name: ---------- Ajagar, moyal shap
Habits: ---------- Climber, bask during day; carnivore
Habitat: ---------- Mixed evergreen and mangrove forest
Status: ---------- Endangered
Threats: ---------- Habitat loss, killing, capture etc.
Conservation needs: - Habitat protection and awareness

English name: -------- Tree frog
Scientific name: ------ *Polypedates leucomystax*
Local name: ---------- Dorakata gecho bang
Habits: ---------- Climber, nocturnal, and omnivore
Habitat: ---------- Widely distributed
Status: ---------- Not threatened
Threats: ---------- Environmental pollution
Conservation needs: - Arrest pollution, pesticide uses

NOTE: Photos of these four key wildlife species were printed on identification cards for use in interviews.

Results and Discussion

This case study revealed that the current Council and Committee members of LNP possess a poorer understanding of biodiversity issues than local people. Furthermore, the participation of local people in decision-making of the Council and Committee was found to be very low and strongly influenced by local elites in these governance institutions. As a result, people living in and around the park who critically depend on forest resources for their livelihoods have been virtually left out of the process of Council and Committee formation.

Knowledge and perceptions on biodiversity issues among local people versus members of the Co-management Council and Committee

In this study, I sought to assess the knowledge and perceptions of local people, the Council, and the Committee of LNP concerning the importance of various trees, animals, and the animals' habitats and foods. I also asked if people had seen specific animals in the forest, in zoos or on television, and whether they had any feelings of like or dislike about local fauna. The results show that 67% of respondents in the study villages and 73% of the Council and Committee representatives generally understand a "protected area" or "national park" to be an area having important natural resources that are protected by the government but in which public access is allowed to an extent. The respondents from local villages who did not understand these categories were not members of forest user groups and most of them were from Kalapur village. More than 75% of the interviewees from Garo Bosti and Kalapur village valued trees as important for various reasons - they produce oxygen; produce wood for fuel, furniture and house construction; provide food and shelter for a variety of wild animals; and offer traditional benefits like wild fruits, vegetables and medicinal plants. Seventy-three percent of respondents from the Council and the Committee highlighted the importance of trees and the forest, saying that they provide oxygen for people to breathe, fuelwood for cooking and eating, and materials for furniture and house construction. Two respondents who also belong to the Committee (one ethnic leader and one eco-guide) also mentioned the important role that forests play in providing medicinal plants for humans and food for wildlife.

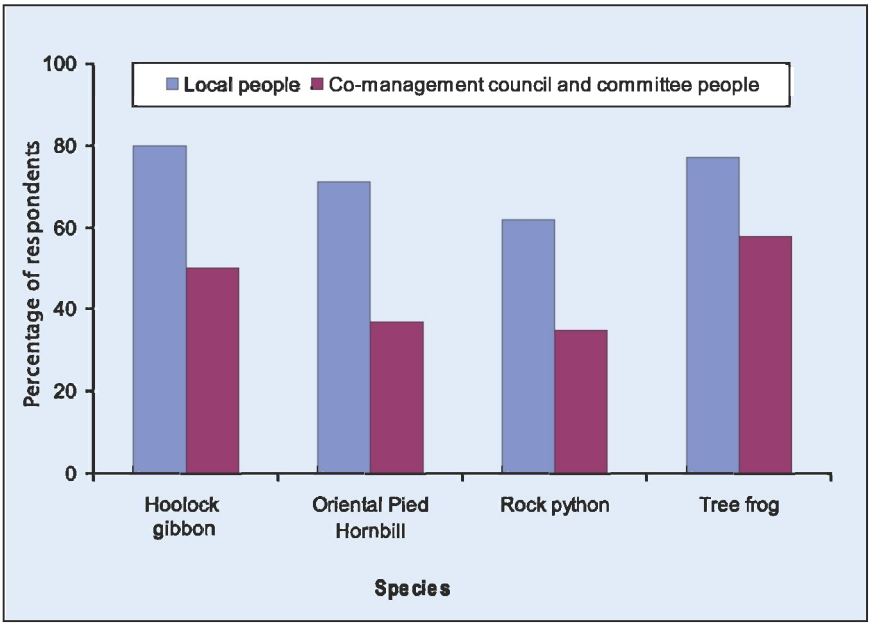


Figure 2: Knowledge of characteristics of key wildlife species by local people versus members of the Co-management Council and Committee

Sixty-two percent of the respondents of the study villages answered accurately about the habitats of these wildlife species. For example, many respondents of these villages replied that hoolock gibbons "are found on the tops of trees and never come down to the ground." However, most of those women of Kalapur who did not belong to NSP forest user groups identified these habitats incorrectly. When I asked Council and Committee members about the habitats of these wildlife species, 35% of them replied correctly overall. Thus, on average, 65% of the members could not answer correctly about the habitats of these wildlife species. The lowest percentage of correct answers was for tree frogs (27%) and the highest for Oriental Pied Hornbill (42%). When asked about the hoolock gibbon, one Committee member replied, "Is it found in Lawachara National Park? I have [only] seen it in the Srimongal Zoo." A large number of the respondents (77%) from the study villages said that the key wildlife species do not harm people or their property. One respondent of Kalapur village replied, "I have never been bitten by a rock python,

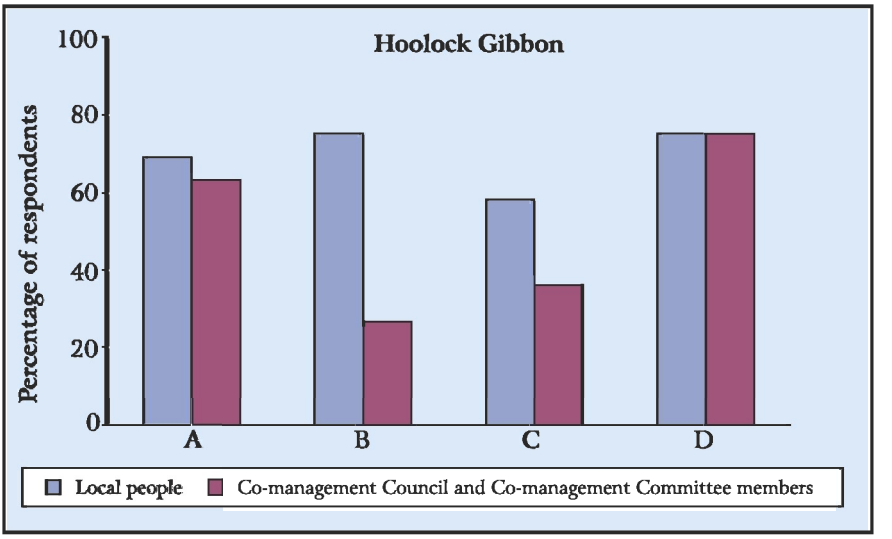
or seen anyone hurt by one... I have not seen any livestock eaten by rock pythons, but we have heard of it. I have never had any skin irritation or swelling from the urine of tree frogs, or had any such mishaps... These are just what we have heard from others."

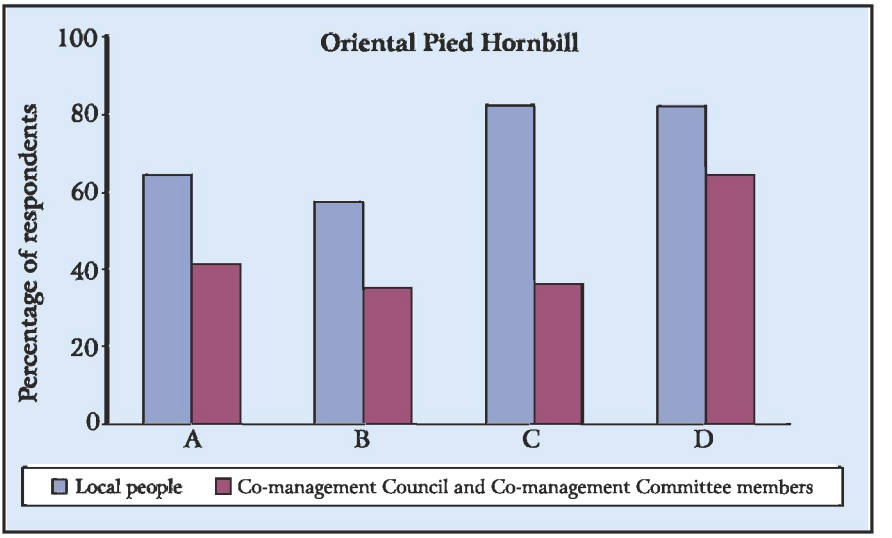
Table 4: Positive responses to questions on selected wildlife species-Local people (LP) versus Co-Management Council/Committee Members (CMM) of LNP

Questions	Hoolock gibbon		Oriental Pied Hornbill		Rock python		Tree frog		Overall perception	
	LP	CMM	LP	CMM	LP	CMM	LP	CMM	LP	CMM
Correct identification	69%	63%	65%	42%	92%	58%	92%	36%	80%	50%
Personal observation	75%	27%	58%	36%	58%	42%	92%	42%	71%	37%
Correct habitat identification	58%	36%	83%	42%	92%	36%	67%	27%	62%	35%
Do not harm people, crops or property	75%	75%	83%	64%	75%	42%	75%	50%	77%	58%

Overall, only twenty-three percent of respondents in the study villages suggested these species do any harm; saying that tree frog's urine causes skin irritation and rock pythons bite or engulf goats and cattle. Among the Council and Committee members, more than half (58%) of them replied that these animals do not harm people's lives or property. However, 58% reported that Rock pythons bite and eat goats, cattle and even man; and half of them claimed that the urine of the tree frog caused swelling and inflammation. Most Forest Department officials were more knowledgeable about the attributes of these species than other members of the Council and Committee or than local people at the study sites. Some respondents from Garo Bosti cited figs (*Ficus spp.*) as one of the most important tree species in the park, providing food for a variety of wild animals (Plate 3). They also expressed apprehension about exotic trees, such as Acacia spp. and Eucalyptus spp., being planted in the park by management authorities.

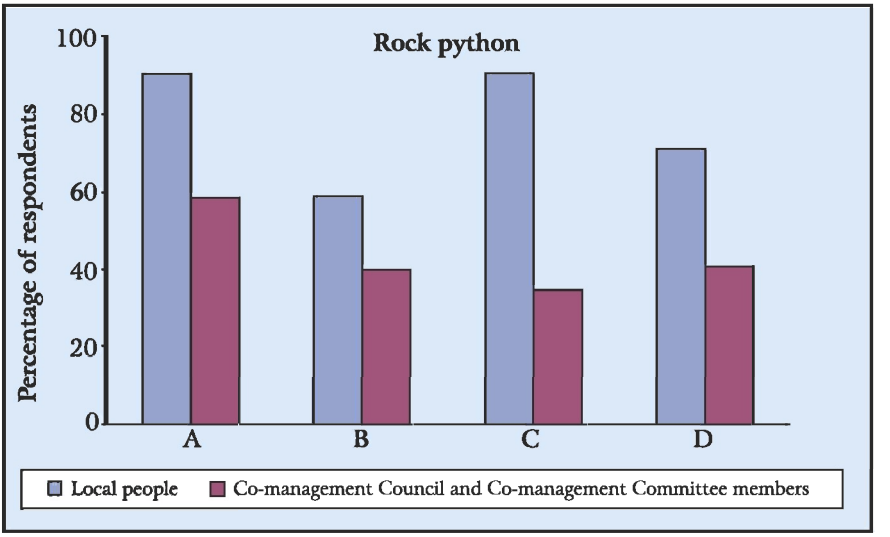
Figures 3-6: Perceptions of wildlife species by local people versus Co-management Council and Co-management Committee members

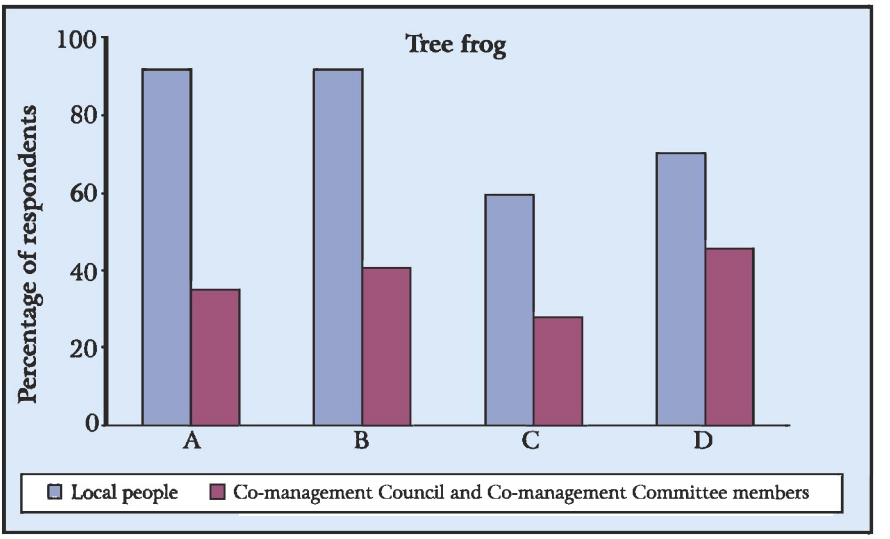




A. Correct identification of species in photo
B. Personal observations of species in wild
C. Correct identification of species habitat
D. Knowledge of characteristics of species

Figures 3-6: Perceptions of wildlife species by local people versus Co-management Council and Co-management Committee members (Continued)





A. Correct identification of species in photo
B. Personal observations of species in wild
C. Correct identification of species habitat
D. Knowledge of characteristics of species

Table 5: Knowledge and perceptions of selected wildlife species among local people

Species	Traditional names	Sightings	Habitat	Harm to people or property	Respondents' feelings towards
Hoolock gibbon	*ulluk, bhulluck, ban manush, banar*	In forests, television, newspaper, zoo, and books	In jungle, forests, and tree top canopy	Does not harm or could bite occasionally	Enjoy seeing in the wild
Oriental Pied Hornbill	*dhanesh, dhanesh pakhi*	In forests long ago, now in zoo and on television	Once seen in forests, now rare	Used to occasionally damage crops and fruits but no longer do	Nice to see but only visible in zoo
Rock python	*ajagar, gachh shap, mayal shap*	Seen long ago in *pahar* (small earth mounds), now in zoo and on television	In jungle, *pahar*, tea gardens	Can bite and/or engulf goats or cattle	No respondents have positive perceptions of this species
Tree frog	*gach bang, banar bang, gechu bang, pahari bang*	In bushes, trees, and sometimes in house yards	Visible in pahar and house yards	Urine can cause sores and skin irritation	No respondents particularly like or dislike

While speaking with members of the Council and Committee members, and with people living in and around the park, I encountered an array of local knowledge and perceptions about biodiversity and park management issues. Local people at the study sites possessed a good understanding of issues like the importance of trees and the purpose of the national park. They were also familiar with the local wildlife's habitats and diet, as well as threats to specific species, and problems affecting park management and conservation. Overall, the local people interviewed had a better understanding of most of the topics considered in this study than the Council and Committee members. However, the Council and Committee members were more knowledgeable (73%) about the concept of "national park" than respondents from the study villages (67%). This was partially because a number of Forest Department officials were on the Council and Committee. Moreover, most of the

people in the Council and Committee were local elite, people from local government, law enforcing agencies, non-government organizations, etc. and, hence, they generally had better access to information on policy matters concerning the national park.

Many local people (75% of respondents from Kalapur and Garo Bosti) have an understanding of the importance of trees saying that they provide oxygen and wood for fuel, house-building and furniture as well as for food and shelter for wild animals, which is slightly more than the Council and Committee members (73%). Concerning knowledge of the importance and uses of trees among local villagers verses Council and Committee members, it is significant to note that the latter group did not mention the value of forests as a source of medicines, vegetables, and foods for human consumption. Furthermore, some respondents of Kalapur and Garo Bosti cited fig trees (*Ficus spp.*) as a source of food to a variety of wild animals while only one respondent of the Council and Committee (an ethnic community leader) mentioned fig trees, saying that they are useful to some primate species in the park.

Figure 2 and Table 4 both illustrate differences in knowledge and perceptions about selected wildlife species between the people of the study sites and those who are involved in the Council and Committee. The findings reveal that the local people from Kalapur and Garo Bosti are generally more knowledgeable than the Council and Committee members in terms of correctly identifying the wildlife species that I showed to them, and their associated habitats. This local knowledge is more pronounced among the people of Garo Bosti, who are very close to the park and depend critically on forest resources for their daily survival, than it is in Kalapur, where people do not depend as heavily on the forest and fewer individuals are members of NSP's forest user groups.

Some respondents from the study villages provided traditional local names for these wildlife species, which were not as well known among the Council and Committee members. Local people whom I interviewed from the villages reported that they saw these species in the wild almost twice as often as the Council and Committee members. On the other hand, a large section of Council and Committee

members saw these wildlife species either in zoos or on television and in newspapers. This is because the local people included within the Council and Committee are mostly elites who do not collect and depend on forest resources for their livelihoods, and consequently have not encountered these species in the wild. This is consistent with research that argues that local communities, especially those living in and adjacent to PAs, often have more substantial and long-standing local knowledge and relationships with these areas than those who have little stake in the forest resources and are living further from the park (Nepal and Weber 1995, Ramakrisnan *et al.* 1996, Ghimire and Pimbert 1997).

In terms of the perceived harm that the key wildlife species do to man or property, it is significant that very few local people believe that tree frog urine causes skin irritation or that rock pythons could swallow goats and cattle. Rather, they said that these claims are just stories or myths that were heard from others and that, nowadays, there are not such mishaps with these species or others. In general, more than half of the respondents of the Council and Committee replied that these animals do not harm people or their property, but a substantial number of them also reported that rock pythons bite and engulf goats, cattle and even men.

Although local knowledge is not necessarily sufficient for effective environmental management and is subject to some limitations (Mauro and Hardison 2000, Berkes *et al.* 2001), there is growing evidence that local ecological knowledge can and should play an important role in wildlife management and conservation in and around protected areas (Gunn, Arlooktoo, and Kaomayok 1988, Johannes 1998, Gilchrist *et al.* 2005).

How do local people participate in decision-making in the co-management of LNP?

Local people's involvement in decision-making in the Council and Committee is found to be lacking and influenced by some local elite. Table 6 reveals that among the 26 local villages, with a total of about 4,000 households, situated in and around LNP, only twelve villages are included in the Council and only eight of these twelve are included in the Committee. This means that more than half of the villages are not represented at either level, whereas two of the areas represented in both the

Council and Committee (Srimongal and Komolgonj) are not even located in the immediate park vicinity. Of the nineteen primary and secondary stakeholders identified by NSP, only eight and three have been included in the Council and Committee, respectively. One representative from the six tea estates is included in the Council, but none are involved in the Committee. In addition, only three and two representatives of the four ethnic communities living in and around the park are included in the Council and Committee, respectively.

Table 6: Basic statistics on stakeholders of Lawachara National Park

Statistic	Total Number	Representatives	
		Council	Committee
Villages located in and around the park	26	12	8
NSP-identified stakeholder groups	19	8	3
Tea estates surrounding the park	6	1	0
Ethnic villages	4	3	2
Bengali villages	22	12	6
Villages inside of the park	2	1	1
Villages outside of the park	24	9	7

Table 7 shows the number of representatives from different groups in the Council and Committee. It reveals that, overall, only 16% and 27% of non-elite local representatives have been included in the Council and Committee, respectively (including forest villagers/ethnic communities and resource owning groups). Taken separately, the Council and Committee are comprised of 6% and 16% membership from ethnic communities and/or forest villages, and only 10% and 11% from resource owning groups, respectively. Thus, the inclusion of local people who depend on the park and its resources for their survival in the Council and Committee remains highly inadequate. A majority of the Committee members (59%) are from different government bodies and NGOs (marked with an asterisk in Table 7).

As a result of this imbalance the current co-management administration strongly reflects the previous management structure, whereby the Forest Department maintained the park with assistance from law enforcement agencies and local government administrations to keep local people out of the forest.

Table 7: Representation of different stakeholder groups in the Co-management Council and Co-management Committee of Lawachara National Park

Stakeholder group	Representatives	
	Council (total = 50 members)	Committee (total = 19 members)
Forest Department	3 (6%)	1 (5)*
Forest villages / ethnic communities	3 (6%)	3 (16)
NGO-organized federations/groups	9 (18%)	2 (11)*
Local government	12 (24%)	2 (11)*
Representatives of NGOs/CBOs	5 (10%)	3 (16)*
Local elites	7 (14%)	3 (16)
Resource-owning groups	5 (10%)	2 (11)
Law-enforcement authorities	2 (4%)	1 (5)*
Other government departments	5 (10%)	2 (11)*

Notes: *From different government agencies and NGOs

It has been well documented that community participation and equality in the decision-making process must be ensured in order to make the co-management of PAs sustainable and effective (Indian Board of Wildlife 1983, Culen *et al.* 1984, Rodgers and Panwar 1988, Kothari *et al.* 1989, IUCN 1993, Vandergeest 1996, Mehta and Kellert 1998, Maikhuri, Rao and Raj 1998, Sing *et al.* 2000, Rao *et al.* 2000, Papageorgiou 2001). Rao, Maikhuri and Saxena (2003) suggest that success in protecting a landscape depends not just on government support and local

management organizations, but also on the reaction and involvement of the local population and their active participation.

This study revealed that local elites and members of the local government dominate in the Council and Committee meetings, leaving other local people in the Council and Committee out of the decision-making process. Very few members of the Council and Committee participated actively in decision-making at the meetings. For example, one chairman of a Union Parishad (a local government administrative unit) and his rival ex-chairman dominated the meeting by disputing their own previously unresolved local political issues and personal interests. An analysis of Committee meeting minutes revealed that, on average, relatively few people are engaged in discussions during the meetings. In such situations, the few local representatives can do very little to contribute to the co-management process for the park. However, this small group of local representatives possesses more knowledge on biodiversity issues than the people who have traditionally dominated decision-making. A review of meeting minutes and observations made during meetings also revealed that such issues as habitat restoration programs, wildlife management and poaching are rarely discussed. For example, among the meetings held until April 2007, only the third meeting of the Committee raised the issue of fruit-yielding enrichment plantations during a discussion on management of the buffer zone for the park.

Threats and problems of LNP identified by the key informants

Interviews with local people identified some major threats to the integrity of LNP, as well as possible remedies to protect the park and its resources from these threats. According to the local people, specific threats include: illicit tree felling, encroachment by the local elite and politicians, collection of forest materials for house construction, collection of wood for fuel, poaching and hunting of wildlife, traditional betel leaf cultivation, and planting of exotic tree species in the park.

Some of the interviews alleged that local people, backed by local elites and politicians, are felling valuable mature trees from the park almost every night. For example, four meeting minutes of the Committee (held from April 2006 to March 2007) revealed that not only local people, but also some of the members of the

community patrolling group (the lowest level of the co-management structure), are involved in these misdeeds. Illegal logging poses a serious threat to the integrity and sustainable management of the park's biodiversity. According to the local population, owners of sawmills in the area surrounding the park also facilitate this illicit activity by maintaining links with illegal loggers. Illegal loggers minimize their risk by selling logs to nearby sawmills in the forest, rather than carrying the whole logs long distances themselves. The minutes of the Committee meeting held on March 2006 provided firm evidence in this regard. Several respondents claimed that some of the forest officials are also involved in the process of illegal tree felling, in coordination with local elites. For instance, one of the Committee members, who is also the group leader of a community patrolling group, reported the following experience with a group of illegal loggers:

> It was about 11:30pm last night. We were patrolling at the northwest periphery of the park. Suddenly, we saw a group of five local people coming out of the forest with fresh cut teak logs. At first, we were astonished to find them fearlessly speaking to us. But then we became even more astounded when we learned that they were doing this by order of the beat officer of Chautoli. After a moment, the beat officer came to the spot and said to us that the logs were for their service in the forests. So we were told to let them go.

Although the authorities have developed co-management bodies for park management, some of their members are involved in illegal timber collection and trading. For instance, one of the respondents alleged that some of the people who had been involved in illicit tree felling within the park are now members of the Committee and/or Council, and are continuing their previous illegal activities.

Land encroachment for the expansion of agriculture also threatens the integrity of the park and its biodiversity. Key informants told us that local elite and politicians have trespassed on designated forest reserve lands adjacent to the park: "They expand their occupation [of agricultural land] day-by-day and conduct agricultural practices which are not compatible with the park ecosystem." Furthermore, a large and increasing number of local people regularly carry their agricultural goods through the park, and collect materials for house building and fuelwood from the park. Respondents also identified roads and highway development activities, gas exploration, and establishment of a gas transmission pipeline within the park as

additional threats. They reported that a substantial amount of forest resources collected from the park is transported to urban areas, adding to the pressure on forest resources.

Some key informants from the villages inside the park said that a number of local people still poach and hunt barking deer, wild boar, jungle fowl (and its eggs), Hill Myna, and other birds and primates. On the other hand, people from the villages outside the park blamed the ethnic minority villagers and other local people for hunting and poaching these wildlife species in the park. Evidence suggests that a number of individuals from both the Bengali and ethnic minority groups are involved in these misdeeds (Mullah and Kundu 2003). Key informants of the study villages also identified the cultivation of betel leaf by the Khasia communities (Lawachara punji and Magurchara punji) as a threat to the park's sustainable management. They claim that traditional betel leaf cultivators clear all of the undergrowth in their allotted areas, explaining that this adversely affects the surrounding wildlife and their habitats. Key informants also noted the planting of exotic tree species in the park by the authorities, and said that these practices are not compatible with conservation goals. I also asked key informants about the status of some of the wildlife and tree species populations in the park. Their responses suggest a general decline in the populations of most of these species since 1990 (Appendix 2).

Conclusion

Policy makers and PA managers need to recognize the importance of local knowledge about biodiversity and ensure local people's representation in the process of co-management of PAs in Bangladesh. The lessons learned from this case study of Lawachara National Park are many. They indicate that the current Council and Committee members possess a poorer knowledge of biodiversity in the park than most local people. The study also explored the knowledge and attitudes of local people concerning wildlife species, biodiversity conservation, and problems associated with Lawachara National Park. The findings support the notion that traditional ecological and local knowledge can be a useful source of information for the conservation of PAs throughout Bangladesh. Therefore, to make the

co-management of LNP sustainable and effective, the people who have a large amount of local knowledge and experience with the PA must be recognized by the park's managers and incorporated into the key co-management institutions. Additionally, benefits derived from the co-management of LNP must be shared with those people who critically depend on the forest.

Participation in decision-making can create room for the sharing of important knowledge by local populations, by ensuring that they receive benefits from the park management and feel ownership for the park and its resources. Integration of this local knowledge into the co-management process will help them to raise their voice and strengthen their commitment to protected areas. Their knowledge will also aid in formulating feasible and applicable management plans for the park, which in turn will help ensure sustainability and the more equitable sharing of benefits among local communities and park management authorities in the long run.

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Appendix 1:

Topics covered in semi-structured and key informant interviews

- Concepts of protected areas and national parks
- Benefits of trees and forests to human communities
- Habitat, shelter, foods, personal observations, and any activities harmful to humans of the selected wildlife
- Likes and dislikes about wildlife, if any
- Tree species of the park important for wildlife
- Stories and myths about the wildlife species and the park as well
- Status of some prominent wildlife species of the park
- Perceptions of illegal activities, poaching, hunting of wildlife, etc. related to the park
- General problems and prospects of the park
- Participation in management activities, decision-making, and co-management of LNP
- Conflicts and influences in decision-making in the meetings of the Co-management Council and Committee

Appendix 2:

Status of wildlife and tree species populations as assessed by key informants

Local name	Scientific name	Before 1990*	After 1990*
Ulluk	*Hoolock hoolock*	+++	+
Mukhpura hanuman	*Tracypithecus pileatus*	+++	+
Banar	*Macaca mulatta*	+++	++
Lajuk banar	*Nycticebus coucang*	++	+
Shuar	*Sus scrofa*	+++	++
Chitra horin	*Cervus axis*	+	-
Sambar	*Cervus unicolor*	+	-
Maya horin	*Muntiacus muntjak*	++	+
Bon chagal	*Capricornis sumatraensis*	+	-
Pipilikabhuk	*Manis crassicudata*	+	+
Uranta kathbirali	*Petaurista magnificus*	++	+
Shojaru	*Atherurus macrourrus*	++	+
Khargosh	*Lepus nigricollis*	++	+
Ram kutta	*Cuon alpinus*	+	-
Ban biral	*Felis chaus*	++	+
Sonali biral	*Catopuma temmincki*	+	-
Gecho bagh	*Neofelis nebulosa*	++	+
Chitta bagh	*Panthera pardus*	+	-
Mecho biral	*Prionailurus viverrinus*	++	+
Kalo bhalluk	*Ursus thibetanus*	++	+
Bagdhash	*Veverra zibetha*	++	-
Myna	*Gracula religiosa*	+++	+
Dhanesh	*Anthracoceros albirostris*	+++	+
Raj dhanesh	*Buceros bicornis*	++	-
Bhimraj	*Dicrurus paradiseus*	+++	+
Choto bhimraj	*Dicrurus remier*	+++	+
Sabuj Ghughu	*Chalcophaps indica*	+++	+
Shama	*Copsychus malabaricus*	+++	+
Bon morog	*Gallus gallus*	+++	++

Local name	Scientific name	Before 1990*	After 1990*
Kalo mayur	*Lophura leucomelanos*	++	-
Ajagar	*Python molurus*	+++	+
Kalnagini	*Chrysopelea ornata*	+++	+
Laodaga shap	*Ahaetulla prasina*	+++	++
Halud pahari kasim	*Indotestudo elongata*	+++	+
Bot	*Ficus spp.*	+++	++
Jam	*Syzygium spp.*	+++	++
Gamari	*Gmelina arborea*	+++	++
Chapalish	*Artocarpus chaplasha*	+++	++
Kathal	*Artocarpus heterophylus*	+++	++

Code: +++ Very common; ++ Common; + Rare; – Extinct

Plate 1:
Co-management Committee meeting

Plate 2:
The village of Garo Bosti

Plate 3:
Figs were cited as an important source of food for wildlife

Can Alternative Income Generating Activities Reduce Dependence on Protected Areas? Evidence from Teknaf Game Reserve

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Abstract

The main focus of this study is to assess the effectiveness of alternative income generating activities (AIGAs) provided by the Nishorgo Support Project (NSP or Nishorgo) as a tool for reducing dependence on forest resources by people living in and around Teknaf Game Reserve (TGR or Teknaf). NSP introduced a participatory co-management approach in Protected Areas (PAs) consisting of the formation of co-management councils, co-management committees, community patrolling groups (CPGs), and forest user groups (FUGs). NSP seeks to use these institutions to develop a holistic approach for conserving biodiversity in TGR. For this study I randomly selected respondents from three CPGs and three co-management council/committees in Shilkhali, Teknaf and Whykong. I chose to research common AIGA options that are practiced at all three sites. I conducted the survey through personal interviews with CPG and FUG members and focus group discussions with Co-management Councils, Co-management Committees and Forest Department (FD) and NSP staff. Semi-structured and open-ended questionnaires were used as part of this study. Information on the demographic and social characteristics of the beneficiaries was also collected. I studied the performance of AIGAs provided by NSP to the beneficiaries for economic improvement and reduction of resource dependence. I discovered that AIGAs are contributing 17% of the total income of the CPG members and only 3% of the total income of the FUG members. In this study, I found that most AIGAs are working quite well but there are some exceptions. I also found that there is a coordination gap among NSP, FD and the Co-management Councils and Committees.

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Introduction

Protected areas (PAs) in the tropics face many threats and are often poorly managed (Wells and McShane 2004). This is because local people's interests are often seen as incompatible with biodiversity conservation and PA management has often followed a "fences and fines" approach that excludes people. However, conservation managers increasingly recognize that local people, local knowledge, and local participation are key factors in realizing sustainable PA management (Svartad et al. 2006). In the 1980s, conservation organizations tried to develop new PA management approaches (i.e., participatory management) that would support local people through alternative income generating activities to compensate them for their loss of access to PA resources. The economic benefits from these activities are intended to reduce people's dependence on protected area resources and therefore their negative impacts on PAs (Svartad et al. 2006).

PAs in Bangladesh have historically been poorly managed. Most of the country's PAs were declared by gazette notification, but no effective management was implemented. Moreover, the people living in and around PAs were not considered nor allowed to participate in PA management.

In 2004, the Nishorgo Support Project (NSP) initiated a co-management approach in five of Bangladesh's PAs on a pilot basis. This approach works by building partnerships between the Forest Department of Bangladesh and key local and national stakeholders that could assist in conservation efforts, especially those living in and around PAs (e.g., co-management councils and co-management committees) (Nishorgo 2007).

NSP aims to collaboratively develop co-management agreements leading to measurable improvements in forest resource conservation in selected PAs. One of NSP's five specific objectives is, "To create alternative income generation opportunities for key local stakeholders associated with pilot co-managed PAs" (Nishorgo 2007). An expected outcome of the project is livelihood improvements for key stakeholders. NSP considers people living within 5 km of the periphery of a PA to be key stakeholders because they are part of a "landscape zone". NSP aims to improve the income of forest-dependent people neighboring PAs by providing alternative income generating activities (AIGAs) consistent with conservation. As

part of this effort, NSP initiated AIGAs in Teknaf Game Reserve (TGR) and four other PAs of Bangladesh (Nishorgo 2007).

The project has been in implementation at Teknaf for the last four years, following an approach of creating alternative income generating activities as a tool for reducing dependence on forest resources. Now is a critical time to investigate the impact of AIGAs on local stakeholders. This case study assesses the potential of AIGAs to reduce forest dependence of people in and around TGR. The study seeks to answer the following three questions:

1. Was the amount of AIGAs distributed to the members of community patrolling groups (CPGs) and forest user groups (FUGs) sufficient for reducing dependency on forest resources?
2. Were decisions about the distribution of AIGAs among the participants discussed in both Co-management Council and Co-management Committee meetings in advance?
3. Was there effective coordination among the FD, the NSP and the CMCs?

Background

Teknaf Game Reserve lies in the hilly range that forms the backbone of the narrow Teknaf Peninsula in the southeast corner of Bangladesh, near the Myanmar border. It encompasses three distinct geological series: Surma Series, Tipam Series and Dupi Tila Series (Choudhury 1969). The range runs in a north-south direction and reaches a maximum altitude of about 700 m above mean sea level (Mollah et al. 2004). It is bordered on the north by reserved forest, on the east by the Naf River, on the south by the town of Teknaf, and on the west by the Bay of Bengal. The northern end of the reserve lies 58 km south of the Cox's Bazaar District Headquarters. The reserve measures roughly 28 km north to south and 4 to 5 km east to west and lies between 20°52' N and 21°09' N latitude and between 92°08' E and 92°18' E longitude (Rosario 1997). The reserve includes the unions of Teknaf, Whykong, Baharchara, and Hnila and the municipality of Teknaf. Formerly a reserved forest (RF) area encompassing 28,688 acres (11,610 hectars), the forest was declared a game reserve in 1983 under the Bangladesh Wildlife (Preservation) (Amendment) Act 1974 (GOB 1984). The gazette notice lists it as covering ten

reserve forest blocks in three forest ranges (Whykong, Shilkhali and Teknaf) in Cox's Bazaar South Forest Division (Forest Department of Bangladesh 2006). The TGR was established with the purpose of preserving habitat for a large diversity of wildlife (Bari and Dutta 2004). Approximately fifty FD officers and staff members are presently working in the reserve.

A total of 115 villages depend on TGR for their livelihoods (this excludes a number of settlements of Rohinga refugees from Myanmar that also rely on the reserve). These villages belong to Baharchara, Hnila, Teknaf and Whykong Unions and Teknaf Municipality. The population is approximately 149,564 people living in 24,373 households, of whom 52% are male. The literacy level is 26%. Nine percent of the population has completed primary education, 3% secondary education, and less than 2% higher secondary education (BBS 2001). Forty-six percent of these villages are located inside the game reserve, 11% on the periphery, 35% adjacent to the game reserve, and 8% are located a little further away. The villages have different levels of dependence on the game reserve. On the basis of resource use and forest degradation activities, about 62% of the residents of the villages have major stakes in the reserve's forest resources, 32% have moderate, and 6% have minor stakes (Mollah et al. 2004). Some of these people belong to Rakhain, Tonchainga, and Chakma ethnic minorities (Mollah et al. 2004). Most people living on the Teknaf peninsula are poor to very poor. About 70% of the households have a total annual income in the range of 15,000 BDT[1] to 45,000 BDT per capita (approximately 220 USD to 650 USD) (Bari and Dutta 2004).

NSP is a comprehensive effort to improve the management of the five PAs in Bangladesh. NSP is funded by the United States Agency for International Development (USAID) and implemented by the International Resources Group (IRG) with collaboration from the Community Development Centre, Rangpur Dinazpur Rural Service and Nature Conservation Management (Forest Department of Bangladesh 2006). NSP seeks to assist the FD in conserving biodiversity (with the assistance of local stakeholders) and to reduce the dependence of local communities on forest resources.

In 2006 a government order of the Ministry of Environment and Forests created eight co-management councils and eight co-management committees in five PAs of

[1] 1 USD = 68.60 Bangladeshi Taka (BDT)

Bangladesh. In TGR three co-management councils were formed with 55 councilors from the following five categories of people: (1) 21 representatives of civil society (e.g., local leaders, teachers, physicians, social workers); (2) four representatives of local government (Upazilla Nirbahi Officer, FD, law enforcing agencies); (3) 21 local people (representatives of resource user groups, resource owners groups, ethnic minorities, and youth groups); (4) six representatives of various government departments (e.g., Agriculture, Animal Husbandry, Fisheries, Social Welfare) working in the PA's surrounding areas; and (5) four representatives of local non-governmental organizations. The Upazilla Nirbahi Officer acts as chairperson and either the Assistant Conservator of Forests or the Range Officer acts as member secretary of the council. Nishorgo also formed three co-management committees that consist of 19 members that are elected by members of the co-management councils (GOB 2006).

NSP supported the formation of 15 CPGs consisting of 595 members to protect forest resources in TGR. The CPGs consist of 28-49 members at different sites. One of the CPGs is for women only and consists of 28 members. To further reduce people's dependence on forest resources in and around the reserve, NSP formed 102 forest user groups (FUGs). Each FUG has approximately 25-40 members. Forty-two of the FUGs are specifically for females. Approximately 1,396 women are FUG members.

To help lessen local people's need for forest resources inside the reserve, Nishorgo provided AIGAs to support CPG and FUG members. AIGAs were also made available to local people in considerable poverty, co-management committee members, and other people that live close to the reserve. NSP provided two basic types of AIGAs: large AIGAs worth BDT 3,500 to BDT 5,000 were given to CPG members, and small AIGAs worth BDT 500 were given to FUG members and people in severe poverty. As of June 2007, 326 (56%) CPG members had received some sort of AIGA support. NSP provided different types of AIGAs, such as cow fattening, nursery development, small trade, fish cultivation, pig rearing, poultry rearing, dry fish selling, rickshaw/van supply, etc. In total, CPG members could choose from about 20 different AIGA options.

As of June 2007, 1,725 FUG members (55%) had received AIGA support. In contrast to CPG members, FUG members were given only one AIGA option:

homestead vegetable gardening. Nishorgo also provided AIGA support to 82 people in severe poverty worth BDT 500 per person. The people in severe poverty try to improve their economic condition by starting small businesses and providing services such as ferry transport.

Nishorgo facilitated the installation of improved stoves (*chullas*) for CPG, FUG, and CMC members with the assistance of two non-governmental organizations (NGOs): Grameen Shakti and Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). Nishorgo also trained CPG and FUG members to build improved stoves – a skill that makes it possible for these people to earn an income building stoves for others. Through June 2007, Nishorgo assisted in the installation of 41 improved stoves. Nishorgo provided improved stoves and biogas plants for businesses and other organizations like residential educational institutions. Nishorgo also helped members of CPGs, FUGs and CMCs to establish eco-cottages in and around the PAs. Two eco-cottages are presently under construction, one near Teknaf Nature Park and another one at Shaplapur, near Shilkhali. Nishorgo is assisting CPG and FUG members to link with NGOs to help them gain access to micro-credit.

Methods

I used random sampling to select groups for semi-structured and open-ended interviews. I interviewed 48 individuals from CPGs and FUGs under the supervision of the co-management councils and committees in Shilkhali, Whykhong and Teknaf Unions (one CMC in each union) to obtain information about the benefits realized from AIGAs. To get an idea of the governance issues involved, I conducted focus group discussions with representatives from the administrative bodies in each of the three sites. To learn about AIGAs and CPGs, I selected one CPG and one FUG from each of the three sites to interview. The CPGs were chosen because they were the first groups to receive AIGA support at each site and the groups were similar in size. I used the five most common AIGAs at one site, while in the other two sites I used the four most common AIGAs (see Table 1).

Table 1: AIGAs considered in survey sample by NSP co-management site area

Different types of AIGAs for CPGs	Shilkhali	Whykong	Teknaf	Total Sample
Cow fattening	3	3	3	9
Nursery	3	3	3	9
Small trade	3	3	3	9
Poultry	3	-	3	6
Fish cultivation	3	3	-	6
Totals	15	12	12	39

I selected one FUG from each site (Shilkhali, Whykhong, and Teknaf) and interviewed three people from each group who had received an AIGA (for a total of 9 FUG respondents). In addition, I conducted focus group discussions with representatives of the co-management councils, FD local officers (such as the Assistant Conservator of Forests, range officers, deputy rangers, foresters, and forest guards) and NSP officials from the three sites. The total number of focus group discussions was nine.

Table 2: Number of focus groups and participants at each of the three research sites

Number of Focus Group Discussions and participants	Shilkhali	Whykong	Teknaf	Total Sample
FD	1 (6)	1(5)	1(5)	3 (16)
NSP	1 (5)	1(5)	1(5)	3 (15)
CMC	1 (9)	1(12)	1(9)	3 (30)
Total	3(20)	3(22)	3(19)	9 (51)

Note: Numbers in parentheses represent number of participants in each focus group

Results and Discussions

AIGAs and Forest Resource Dependence: *Were the benefits from the AIGAs distributed to CPG and FUG members sufficient to reduce their dependency on forest resources?*

NSP began distributing AIGA to participants in Teknaf in February 2007; hence it is too early to assess how these benefits might affect people's forest dependence. However, I have observed that CPG members at the Shilkhali Garjan site are doing better in comparison to the other two sites as their AIGAs were distributed earlier in comparison to the others.

I found small trade to be one of the most successful AIGAs. It has provided good returns at all three sites in the reserve. Most of the AIGA-supported small traders are successfully running their businesses. They also invest their own capital into their businesses. The AIGA-supported small traders can earn returns immediately after starting their business. That is why most beneficiaries tried to get AIGA support for small trading. While most people prefer to run their small business individually, there are a few cases of participants developing partnerships that appear to be doing quite well.

Though it is a slow process, I found that AIGAs on cow fattening were doing well at all three sites. Many participants earn a good income from this AIGA, with those who received cows and training on fattening them earlier doing better than others. Nursery development has become another successful AIGA at all three sites. The individuals involved in this activity have developed and improved their nurseries and earn a good amount from this activity. One CPG member from Shilkhali site earned BDT 35,000 last year from selling tree seedlings raised in his nursery. He is continuing his nursery this year and expects to earn a good income from selling his products. Another positive side for people who invest in tree nursery activities is that FD staff members can provide advice and assistance, as FD staff members are experts on nursery raising and plantation activities. Marketing is the only problem owners of plant nurseries face. If NSP could help nursery owners to market their products they would benefit greatly.

Originally, large AIGA support (BDT 3,500 to 5,000) for plant nurseries was to be made available only to CPG members. At first, not many CPG members were interested in participating in tree nursery activities. That gradually changed. NSP decided to also provide large AIGA support for plant nurseries to FUG members, CMC members and other people who lived outside but near the reserve. NSP provided more support for plant nursery activities because it was felt that tree nurseries helped to improve biodiversity in the reserve. Tree nurseries could meet the combined objectives of increasing biodiversity and generating income (Scherl *et al.* 2004).

Poultry rearing was another AIGA, but I found that option to be unsuccessful at all three sites. Participants in poultry rearing activities had two options: country or hatchery varieties of chickens. The country variety of chickens was susceptible to

disease and participants could not earn an income from it. When the country variety of chickens died from Ranikhet disease, many of the beneficiaries' previous household chickens also died. Because TGR is in a remote area and both veterinary doctors and medicine are not available there, the AIGA-supported persons could not take the necessary actions to recover from the disaster. The situation is a little better in the case of poultry rearing using the hatchery variety of chickens.

The AIGA on pisciculture at the Whykong site almost failed because most of the supported individuals did not earn a good return from fish rearing. Some people have already stopped their fish cultivation activities for various reasons. In some cases, failure occurred because fish fingerlings were not distributed at the proper time and people did not prepare their pond properly before releasing the fish fingerlings. AIGA recipients were not very cautious about their fish rearing and ultimately most failed in sustaining the AIGAs. However, at the Shilkhali site the AIGA-supported fish cultivators are doing quite well. They are continuing the AIGA and have received some returns from selling their products. They were already experienced with pisciculture and considered the project to be important. This is likely the reason why they have been more successful than people at the other sites. The success also depends upon the consciousness of the recipients about how they are taking care of their AIGAs and the levels of monitoring from FD, NSP and CMC.

Some AIGA-supported persons in the fish business in the Shilkhali area have temporarily switched from their AIGAs to other alternatives. The main reason for switching from the fish business to another activity was that the fish business was suitable only in the winter season. During this time, they earned a good amount from their business. Outside of the winter season, they utilized the money in cow and goat rearing. They will continue this activity up until the next winter, at which time they will sell their products and again invest in the fish business.

Building and installing improved stoves (chullas) was found to be another successful AIGA in TGR. It is compatible for income generation of the chulla makers and it simultaneously helps to directly reduce the fuelwood consumption of the people. NSP has trained many CPG and FUG members as improved chulla makers with the help of another two NGOs and this is now becoming a good source of income for the chulla makers, as they receive BDT 200 per chulla. The improved chullas

can be installed by local people and can provide a further source of income for those individuals who learn to make them. NSP is helping the CPG, FUG, CMC and neighbors of the protected area with the installation of improved chullas by providing 50% of the cost that is required for installation. Studies have shown that the improved chulla can reduce fuelwood consumption by approximately two-thirds when compared to the traditional chulla. These new chullas can directly help to reduce consumption of fuelwood and the dependence of local people on wood from TGR.

The FUGs are doing well with their AIGAs, especially considering the limited amount of support they received. FUG members received only BDT 500 for homestead vegetable gardening. For the gardening they followed the *kalikapur* model in which the producer can get different types of vegetables year round. They have earned some returns from their AIGAs, but they do not have much capital for continuing the vegetable gardening. They generally spend everything that they have earned from vegetable gardening on meeting their daily needs. In most cases, participants received support only once and have insufficient funds to sustain the project. More financial support is required to improve AIGAs and monitoring should be strengthened.

Considering that thousands of people who are completely dependent on forest resources live in and around TGR, the intensity of AIGAs is very limited. As of June 2007, 326 of 595 CPG members (54%) had received AIGAs. Of the 3,122 FUG members, 1,725 FUG members (55%) had received AIGAs. Although AIGA support has been received by more than half of the CPG (BDT 3,500-5,000 per member) and the FUG (BDT 500 per member), the return received from AIGA support is not a considerable percentage of their total income. In the case of CPGs, the return from AIGAs is 17% and in the case of FUGs, it is only 3% (Figures 1 and 2). Furthermore, there are about 149,564 people living in and around TGR, out of which 62% play a major role in resource degradation (Mollah et al. 2004). Considering that the goal is to reduce dependence on forest resources, the amount of AIGA support provided to accomplish this goal is minimal. Undoubtedly, AIGAs have had a positive impact on livelihoods and reducing dependence on forest resources, but they should be made much more available and more consistent for the forest-dependent people in and around TGR.

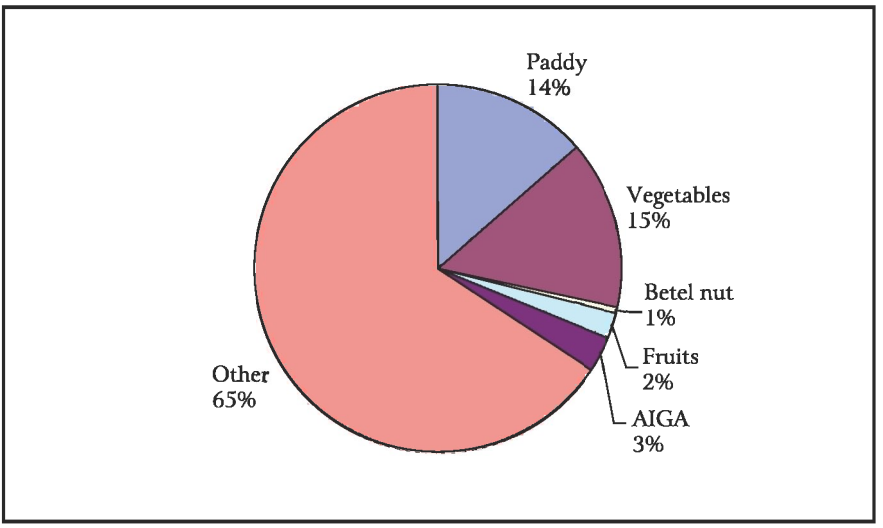

Figure 1: Different sources of income of FUGs in TGR

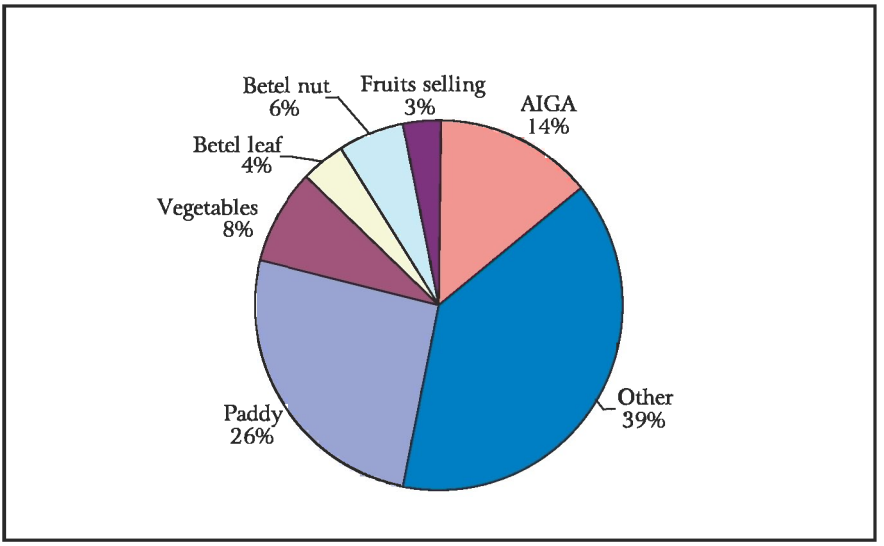

Figure 2: Different sources of income of CPGs in TGR

Distribution of AIGAs: Were decisions about the distribution of AIGAs made in an equitable and participatory manner?

At present, there are 15 CPGs working in TGR. Previously only three CPGs had been formed in the three sites. Then NSP decided to convert some FUGs to CPGs, but this was not discussed in much depth with the FD and CMC. Ultimately the number of CPGs rose to 15. These groups have become burdens for the current project because the more CPGs that are formed, the more AIGAs that need be distributed. The NSP is limited by its budget but has already formed and made commitments to the new CPGs. As a result, NSP reduced its per head AIGA support, which made the CPG members angry and ultimately dissatisfied. The average amount AIGAs were worth during 2006 was 3,500 BDT, while the average amount delivered by AIGAs before that was 5,000 BDT. Those CPG members who received less AIGA support than others but were engaged in the same activities became dissatisfied. They felt that they had the right to receive the same AIGAs as others received.

In many cases, NSP did not have much discussion with the FD and CMC members about the selection of CPG and FUG members. As a result, in some cases inappropriate people were selected for CPG and FUG groups. NSP did not talk much with the CMC and FD before distributing the AIGAs. The CMC and FD staff members were not well aware of the responsibilities of their job. As a result, inappropriate people received inappropriate AIGAs. For example, individuals with no experience in raising poultry received AIGAs in poultry rearing, which they were unable to utilize and which ultimately failed. Situations like this have had a negative impact on AIGAs as a whole. In some instances it was found that NSP changed previous decisions about AIGAs months later. Initially, NSP formed FUGs and distributed AIGAs among them. Then, three to six months later, FUGs were converted to CPGs without adequate consultation with the FD and CMC. The converted CPGs then received AIGAs as CPG members. As a result, those who received AIGAs as FUG members earlier received them again through the CPG. At the Teknaf site, one person received four types of AIGAs from the NSP. At first he received an AIGA as a FUG member. Then the FUG converted to a CPG and he received an AIGA as a CPG member. Next he received training as an eco-tour guide, which was also a source of income for him. Finally, he received support in establishing an

eco-cottage. Furthermore, in the Shilkhali area it was found that within the same household a mother and/or wife would be a member of the FUG and the husband and/or son would be a member of the CPG. Therefore, they both received AIGA support, while some households received none. As a result, it was found that the AIGAs were not distributed as rationally or equitably as they could have been.

The situation is changing slowly. When this co-management approach was started no one was experienced in it. As a result, some mistakes were made in the distribution of benefits. But over time much discussion has been held on this and the situation is developing day by day. The trend of AIGA support distribution by NSP is shown in Figure 3. I have collected the data from the monthly reports on AIGAs submitted by the NSP site offices. The distribution trend is discontinuous. Ideally there would be a rational, equitable and continuous flow of benefits.

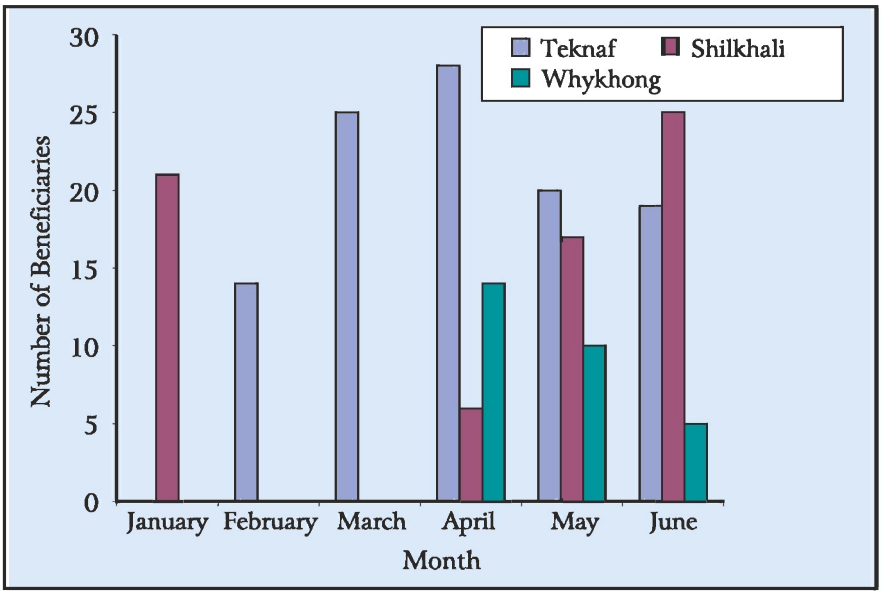

Figure 3: AIGAs supports to the CPGs members in three NSP sites of TGR

Table 3: Distribution of AIGAs in different groups in TGR

	Nursery	Cow Fattening	Small trade	Fish cultivation	Homestead gardening	Poultry rearing	Total	Percent
CPG members	3	9	9	4	0	6	31	65%
FUG members	3	0	0	2	9	0	14	29%
CMC members	1	0	0	0	0	0	1	2%
Non-roup members	2	0	0	0	0	0	2	4%
Total	9	9	9	6	9	6	48	100%

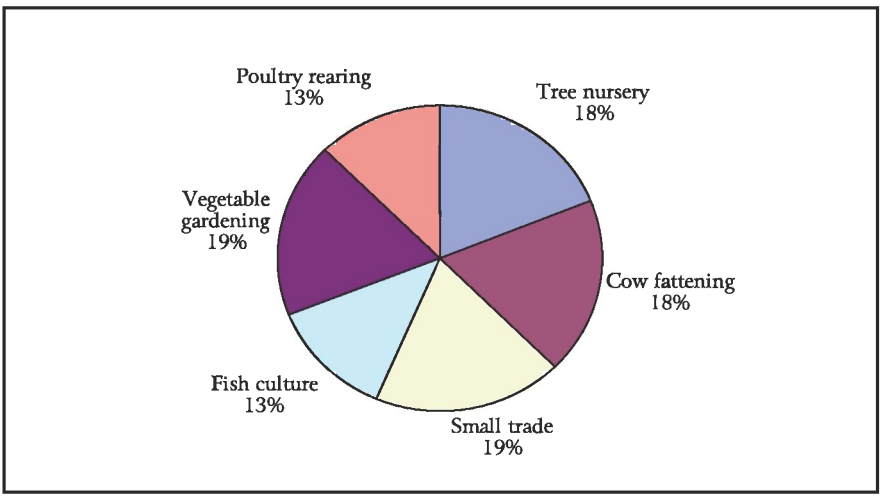

Figure 4: Different options of AIGAs distributed in TGR

Implementation and monitoring of AIGAs: Does coordination exist between FD, NSP and CM Councils and Committees for the implementation and monitoring of AIGAs?

Active involvement of the CMC and FD was not found at any of the three sites at TGR. Only one copy of the AIGA-supported persons list is kept in the NSP offices, but no copy has been supplied to the CMC or FD. So, the CMC and FD do not have clear ideas about who is getting what AIGAs and how their performance is. Thus, supervision from the FD and CMC has not been possible. As a result, an information gap exists between NSP, FD and CMC. This is due not only to the NSP staff, but also to the FD and CMC members who were not very interested in

the AIGA list. It is their duty to collect the list and monitor the supported persons' performances. As a consequence of not monitoring, there is no clear idea about whether AIGAs are contributing towards reducing forest resource dependency or not. This will ultimately affect their ability to achieve project objectives for livelihood enhancement.

The AIGAs were not all distributed at the same time. The process was done step-by-step on primarily a monthly basis. Decisions regarding the timing of AIGA distribution to beneficiaries were controlled by NSP. Some sharing of AIGA distribution responsibilities among CPG members has existed. Although NSP has shared some AIGA distribution responsibilities with the CMC and FD, there has been very little information sharing with them on the distribution of AIGAs to FUGs. The subject of AIGA distribution has rarely been discussed at the monthly co-management committee meetings. The discussions that have occurred have happened at the time of distribution, when questions have been asked to the local beat officer of the FD. This is not sufficient. Thus, there remains an information gap among the CMC, FD and NSP. As a result, though they intend to contribute to the improvement of local livelihoods, a lack of coordination is hampering this effort. In all stages of distribution, AIGAs should be discussed in the co-management committee meetings with active participation from both the FD and CMC and together decisions should be made, actions taken, and monitoring carried out.

Monitoring of the AIGAs was found to be the most neglected part of the project. As AIGAs are not loans, there is no function for loan recovery and so the NSP staff and to some extent the FD and CMC members are reluctant to measure the success of the AIGAs. The NSP, CMC and FD maintain no regular progress reports on the performance of AIGAs. As a result, they do not have any data on the performance of AIGAs. These activities should be regularly monitored and reports should be kept and discussed in the co-management committee meetings. The monitoring should be done in a collective manner. The findings should be sent to decision makers in order to help them better plan for the future. A lack of communication and coordination with the FD and CMC members has resulted in insufficient monitoring of the AIGAs and poorer outcomes overall.

Recommendations

Based on my research and findings, I can suggest the following recommendations for enhancing TGR's alternate income generating activities (AIGAs):

1. The amount that was provided through AIGAs was found to be insufficient in every case. The financial worth of the AIGAs – especially for CPGs and FUGs – should be increased.
2. Some AIGAs had higher failure rates – especially poultry rearing. The reasons behind this should be investigated further so that lessons are learned for future improvement.
3. In some cases inappropriate persons were included as members of CPGs and FUGs and received AIGAs. It should be ensured that appropriate persons receive appropriate AIGAs.
4. A lack of coordination among the FD, NSP, and CM Councils and Committees was prevalent. Coordination among NSP, FD, and CM Councils and Committees should be considerably improved.
5. In the majority of cases it was found that AIGAs were distributed without much discussion in the co-management committees. Every decision about the distribution of AIGAs should be discussed in the CMC meetings and made on a consensus basis.
6. The experience of successful AIGA supported persons and projects can be shared with others. These individuals can also be engaged as trainers for the new AIGA recipients.
7. The existing monitoring systems were found to be very weak. A strong monitoring system should be developed with the involvement of representatives from the FD, CMC and NSP.

Conclusions

The majority of AIGAs distributed by the NSP to the CPGs and FUGs were found to be successful. Cow fattening, small trade, nursery development, fish cultivation, homestead vegetable gardening and improved chulla installation have experienced success while poultry rearing has consistently failed at all three sites. The success rate has depended, in part, on the consciousness of both distributors and recipients

of AIGAs and the monitoring of their work. The success rate is higher where a strong monitoring system exists. Timing was found to be another factor contributing to success. Some AIGAs are very time sensitive – like fish cultivation and poultry rearing. Because AIGAs on fish cultivation at Whykong were not distributed at the proper time, the project almost failed. However, in the Shilkhali area fish rearing was found to be successful.

Currently, AIGAs are playing a limited and inconsistent role in reducing forest dependence among key local stakeholders in and around TGR due to inadequate support and a lack of consistency and coordination in their implementation and monitoring. The amount provided as AIGAs was found to be insufficient in all cases. As of June 2007 (the fifth and probably final year of project implementation), only 54% of CPG members and 55% of FUG members had received AIGAs. The project is supposed to be completed in June 2008, and thus very limited time remains for project implementation. The results of this study reveal that only a little more than half of the CPG and FUG members have received AIGAs. The remaining members will probably not get AIGAs during this project period and this will have a negative impact on the non-recipients. A notable lack of coordination among the NSP, FD and CMC was also found in this study. No collective decisions between the groups were being made about the AIGAs. As a result, a communication gap exists among the people who are working for NSP and the CPGs and FUGs. Moreover, the monitoring of the overall activities of AIGAs was found to be the most neglected part of the project. NSP officials are the only ones directly involved in AIGA distribution, supervising, etc. The active participation of FD and CMC members with NSP members is urgently needed. More attention to monitoring and implementation of the project is also required from policy makers.

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Fuelwood, Alternative Energy and Forest User Groups in Chunati Wildlife Sanctuary

Bikash Chandra Saha Roy[1]

Abstract

This study examines the introduction of improved, energy-efficient 'chulla' stoves and their potential to help reduce local people's dependence on Chunati Wildlife Sanctuary for fuelwood. Six villages in close proximity to Chunati Wildlife Sanctuary (CWS) were selected for this study. Data were collected from members of female forest user groups (FUGs) who are associated with the Nishorgo Support Project. The roles of the Co-Management Committee, Co-Management Council and community patrolling groups in the co-management process were studied. Information about relevant demographic and social factors of FUGs was also gathered and analyzed. The collection, consumption and selling of fuelwood were key issues researched in this study. Specifically, I examined whether improved chulla users were more involved in fuelwood collection, consumption and selling in the study area than users of traditional stoves. The introduction of improved chullas is an important issue because these stoves help to minimize people's forest dependence by reducing the amount of fuelwood required to meet their household needs. This study discusses implications for improving the livelihoods of FUG members through the introduction of improved chullas and examines the effectiveness of these efforts. It aims to promote enhanced access to improved chullas to all members of the local communities surrounding Chunati Wildlife Sanctuary and other protected areas.

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Introduction

Nearly 36 million acres of natural forests are lost each year worldwide – an area bigger than the state of New York. The world's poorest people bear the brunt of this loss, since forest resources help to sustain eighty to ninety percent of the 1.2 billion people in the world who live in extreme poverty (WWF 2007). In many developing countries, wood is the primary source of fuel because rural communities cannot afford other alternatives. Bangladesh suffers from a scarcity of energy resources and is thus largely dependent on wood for fuel. Furthermore, its forests are subject to increasing land encroachment and there is a lack of both commitment toward and education for nature conservation. The total area affected by encroachment is estimated to be about 36,000 hectares, with approximately 100,000 people thought to be encroaching on forest land (Haque 2007). The primary reasons for encroachment in Bangladesh include the loss of legal rights to lands that local populations historically had tenure over, ambiguous boundaries between forests and cultivable lands, and a failure to complete the forest settlement operations initiated in the 1950s (Haque 2007). Education and awareness-raising programs can play an important role in improving the capacity of people to address environmental conservation issues (Rahman 2007).

The Bangladesh Forest Department is the primary government agency responsible for forest conservation and wildlife protection. However, despite their efforts and due to the factors mentioned above, the previously dense forests of Bangladesh have been continuously threatened by land encroachment and logging. As a result, the forest area has been reduced by more than 50 percent over the last 20 years and currently comprises only seven percent of its total land area (FAO 2004). Simultaneously, support has arisen for nature conservation in Bangladesh through the improved management of protected areas via a co-management process. The Nishorgo Support Project (NSP) was initiated in 2004 to coordinate government efforts for co-management. NSP is administered by the Forest Department in collaboration with key conservation stakeholders and has been charged with developing and implementing a co-management strategy for the country's protected areas based on the premise that such partnerships are essential to achieving conservation goals. The project is being carried out at five protected area pilot sites, including the Chunati Wildlife Sanctuary (CWS) (NSP 2004). Nishorgo has

undertaken various programs at Chunati, where the fuelwood crisis is a major concern and local people are heavily dependent on forests for their energy needs.

To address the problem of forest degradation from fuelwood harvesting, NSP has developed a program for the introduction of improved "chullas" (cooking stoves). Traditional chullas are mud stoves while improved chullas have an internal metal plate and a plastic pipe that reduce indoor air pollution and increase energy efficiency. Introduction of more efficient cooking technologies is an important tool for minimizing the fuelwood crisis in rural areas without electricity. In collaboration with NSP, the German Technological Cooperation (GTZ) provided initial technical support for installing improved chullas in 2004. Recently, NSP and Grameen Shakti, a Bangladeshi NGO, have partnered to launch a program to promote improved cooking stoves in communities near NSP's pilot protected areas. The aim of this partnership is to address the high demand for biomass fuels and the adverse health effects of indoor air pollution caused by cooking on traditional stoves (Grameen Shakti 2007). Grameen Shakti will provide the technical support for installing improved chullas with financial support from NSP (Biswas, personal communication 2007). The improved chulla is an important new technology because of its low maintenance costs. Furthermore, the average consumption of fuelwood using the improved chulla is 50% less than the consumption using a traditional chulla. It is also healthier to use because it significantly reduces the level of indoor air pollution that is a major contributor to respiratory illness among rural dwellers. In addition, the improved chulla is easier to handle and helps to reduce cooking time.

During the last two years, the provision of improved chullas has been an important part of NSP's co-management activities in Chunati Wildlife Sanctuary, and they have worked to provide stoves and training on their use to members of various forest user groups (FUGs). At the beginning of the project in 2004, NSP gave their commitment to FUGs that improved chullas would be installed free of cost. However, due to unforeseen decision making changes and planning difficulties, chullas could not be provided to the majority of FUG members. Many FUG members have shown an interest in installing improved chullas, especially after seeing the advantage of such chullas from their neighbors. Nonetheless, due to the high cost of installing the stoves and the changes in NSP policy, many households have

not benefited from this technology. As a result, many FUG members continue to extract large amounts of fuelwood from the forest of CWS.

The purpose of this study is to explore the evidence for improving the livelihood status of FUGs and reducing their fuelwood dependence through the introduction of improved chullas in the villages surrounding Chunati Wildlife Sanctuary. In particular, I will examine the effectiveness of the improved chulla stove program in minimizing reliance on fuelwood by local people.

Background

Chunati Wildlife Sanctuary is comprised of a tropical semi-evergreen forest, situated about 70 km south of Chittagong city and to the west of the Chittagong-Cox's Bazaar Highway at 21°40'N latitude and 92°07'E longitude. The sanctuary's terrain is quite varied, with shallow to deep gullies and gentle to steep slopes. The elevation ranges from 30 to 90 meters. The forested land is composed of about 890 hectares of bush, 84 hectares of Garjan (*Dipterocarpus species*) forest and 13 hectares of small crown forest. Chunati Wildlife Sanctuary was formally established under the Wildlife Act of 1986. Until the mid-1980s, the area was covered with a dense forest of Garjan and other hardwood species. However, demand for wood for boat building and other commercial enterprises contributed to rampant harvesting and rapid deforestation during the late 1980s.

It is estimated that the Chunati Range is home to 7,810 households and a total population of approximately 50,000 people. They live in forty-four paras (villages) in and around the sanctuary. Among them, twenty-four "paras" are located inside CWS and another twenty are located within one kilometer of the sanctuary boundary. Of these forty-four paras, twenty-nine are located in Chunati Beat (a local geographical unit of forest administration), nine in Aziznagar Beat, and the remaining six in Herbang Beat. The most common occupations of people in the Chunati Range are agriculture and wage labor.

FUGs were established by NSP in 2004 and participants were invited from communities living in the protected area or relatively near to the forest. The groups are intended for people dependent on the sanctuary's forest resources. After the formation of the Co-Management Council and Co-management Committee, the

communities of the Chunati Range were divided into five sectors. The total population and distribution of FUGs in Chunati Wildlife Sanctuary is shown in Table 1 below.

Table 1: Population and distribution of FUGs in Chunati Wildlife Sanctuary

Name of Beat	Name of Sector	Male FUGs		Female FUGs		Total FUGs	Total members
		Number of FUGs	Male members	Number of FUGs	Female members		
Chunati	Sector 1	2	34	4	71	6	105
Chunati	Sector 2	2	55	4	105	6	160
Chunati	Sector 3	0	0	11	240	11	240
Aziznagar	Sector 4	4	73	3	74	7	147
Harbang	Sector 5	3	60	5	155	8	215
Total		11	222	27	645	38	867

Nishorgo Support Project activities related to FUGs

In 2004, Chunati Wildlife Sanctuary was selected as one of five pilot sites for co-management under NSP. NSP considered thirty-eight paras for inclusion in the project activities during the pilot period. With financial support from NSP, a baseline survey was conducted at the beginning of the project to collect data on the communities' demographic profiles. Since then, NSP has provided training and support for a variety of activities, including plant nurseries and seed collection, small businesses (e.g., poultry, fishing, rickshaws) and seventeen improved chullas, eight of which were funded. Data on NSP's activities at CWS show that out of 867 FUG members, 165 individuals (19%) have received financial benefits or training from NSP. The rest of the FUG members are to receive the same benefits during the remainder of NSP's implementation period. One objective of NSP support to FUGs is to raise awareness about the need to protect the forest, and to thereby enhance biodiversity in the Chunati Wildlife Sanctuary. FUGs are responsible for raising awareness among villagers.

Pressures on the forest

The most common direct cause of deforestation in Bangladesh is land clearance for agriculture, which is often facilitated by shifting cultivation in hillside forests. Bangladesh's high population density results in intensive competition for very limited land resources. Thus, at the local level, land encroachment due to the expansion of agriculture and settlements, combined with increased timber extraction, hunting, and collection of NTFPs (e.g., fuelwood, bamboo, cane), is resulting in deforestation and the degradation of Bangladesh's natural resources (Haque 2007). Wealthy and elite community members have exercised their influence over the forest for many years through bribes to the Forestry Department and other forms of corruption. As a result, wildlife numbers in the forest have declined. The forests continue to be burned and cleared for both cultivation and settlements. The FD does not permit the FUGs to patrol the forest during the daytime because the perceived threat of members potentially taking part in these illegal activities. Only forest guards and other FD staff are allowed to go inside the forests during the daytime. FUGs are only allowed to patrol forests at night from the roadside and are not permitted to go inside the forest during the patrol period.

Local institutions

There are several local institutions involved in managing and protecting CWS. The Co-Management Council (CMC) serves to monitor and perform tasks according to the work plan for landscape development activities. The CMC's primary concerns are the changing livelihoods of FUG members and the conservation of natural resources and wildlife in CWS. There are also several Community Patrolling Groups (CPGs) that have been formed to protect the forest and its wildlife. They work from 10 pm to 4 am. Seven groups perform their duties on a rotating (weekly) basis. Each group is comprised of 5-6 members who patrol together one day per week.

Research Objectives

The main goal of this study is to demonstrate the potential of the introduction of improved chullas for reducing pressure on natural resources in Chunati Wildlife Sanctuary. The specific objectives of the study are to reveal:

1. The social and demographic characteristics of FUG members
2. The influence of improved chulla use on household fuelwood consumption
3. The influence of improved chulla use on involvement in fuelwood selling
4. How chulla introduction has helped reduce dependence on the forest
5. How certain marginalized groups and the poor have insufficient access to chullas

Methodology

This research was carried out by means of key informant interviews and stakeholder group discussions. In each of the six study sites, questionnaires were given to female respondents only. The reason for this was because women are generally more available in the household during the daytime than men. There are also more female FUGs (38) than male FUGs (27) at CWS. The breakdown of the location, composition and size of the various FUGs sampled is shown in Table 2.

Table 2: Location, composition and size of FUGs sampled

Name of village or para	Sector	Beat name	Total FUG			FUGs in sample	Members per FUG	Sample size	Percentage of FUG members
			Male	Female	Total				
Roshider Ghona	1	Chunati	2	4	6	1	17	10	59%
West Shuphinagar	2	Chunati	2	4	6	1	25	10	40%
Borua Para	3	Chunati	0	11	11	1	23	10	43%
Rohomania para	3	Chunati	0	11	11	1	18	10	56%
Moddho villagers' para	4	Aziznagar	4	3	7	1	22	10	45%
Vandarir Deba	5	Harbang	3	5	8	1	30	10	33%
Total	5	3	11	38	49	6	135	60	44%

Sixty women from six different villages were interviewed, which amounted to about 44% of the total FUG members of these villages (see Table 2). Out of the sixty respondents, 83% were Muslims and the remaining 17% were Buddhists from the Barua ethnicity. Key informant interviews were carried out with CMC members and group discussions were held with the CPGs. The study was conducted from February to August 2007. Within the six sample villages, stratified random sampling was utilized for selecting individual respondents with educational level considered as a major factor. Focus group interviews were conducted with members of female FUGs in the Chunati Range. There were approximately nineteen members in each group discussion. For the CMC and CPG discussions, a questionnaire was also used for collecting information about NSP activities and about the FUGs. The questionnaires and interviews emphasized people's knowledge, views, and experiences with respect to NSP activities. Lastly, data tabulation and analysis was completed using the statistical computer software program SPSS (Statistical Package for Social Science).

Results and discussion

Social and demographic characteristics of female FUGs

In order to get a better picture of the socioeconomic profile of the FUGs, some basic demographic information was collected on age distribution, education level, literacy, household earning patterns, gender work roles, occupation, food sufficiency and income. Among the respondents, the 25-34 age class was the largest (46.7%) in the six villages, followed by 15-24 year olds (30%), 35-44 year olds (15%), and those who are 45 and older (8.3%) Results also revealed that 72% of the female FUG members have no formal education, 17% have a primary school education, 10% have a secondary school education, and less than 2% have a higher degree. Of the 72% who had not gone to school, many had received an informal education at home and most were able to read and write basic Bengali.

According to social customs in Bangladesh, husbands are typically considered the head of the household. Men normally work outside of the household while their wives take responsibility for most tasks within the home, including cooking and collecting fuelwood from the forest. The women interviewed for this study were

also involved in a variety of economic activities outside the home to help support their family. Almost fifty-seven percent of interviewees reported being involved in both agriculture and day labor (pulling a rickshaw, collecting sand or fuelwood for sale, etc.). Nearly thirty-two percent of the interviewees are engaged in vegetable cultivation, agriculture, and day labor throughout the year. Ten percent said that they were engaged in day labor only, while less than two percent had no occupations outside of the home other than occasionally earning day wages through vegetable cultivation.

Based on the data gathered and direct observations, I conclude that all of the interviewees from the FUGs are living in poverty. For instance, all of the interviewees expressed that they had gone through times when they had insufficient food and lacked adequate shelter. An estimate of the monthly income of each individual household was converted into annual income. For those who do daily labor, wages vary from person to person depending on the type of work performed (from about 120 to 150 BDT per day). Individuals who assist with agricultural work during peak harvest times can earn 5,000 – 10,000 BDT annually after deductions from borga (sharecropping). Each of the interviewee's approximate household incomes was calculated and FUG households were then categorized into five income groups. It was determined that 45% of the households interviewed had income ranging from 40,000 to 60,000 BDT per year (1 US Dollar = 68.425 Bangladesh BDT as of October, 2007), 50% earned 60,000 to 80,000 BDT per year, and 5% earned household incomes above 80,000 BDT annually.

Household fuelwood consumption

In response to questions on the use of forest resources for fuel cooking stoves, 94% of the improved chulla users reported using only fuelwood for their stoves, while the remaining 6% used both fuelwood and fodder. Fodder increases the amount of dust and level of indoor pollution resulting from cooking. The households using traditional stoves depend more heavily on fodder. Twenty-eight percent of homes with traditional chullas use fuelwood alone while the remaining 72% collect both fuelwood and fodder to heat their stoves. All of the interviewees are primary users of forest resources and are highly dependent on fuelwood from either their own forests and/or the forest within CWS. Many of the interviewees have been living inside the forest at CWS for a long time.

This study showed that improved chulla (IC) users collect comparatively smaller amounts of fuelwood than traditional chulla (TC) users. IC users collect more fuelwood during the dry season than during the rainy season and then store it for future fuelwood consumption. TC users do not make any prior arrangements for collecting fuelwood and have a greater likelihood of running short because TCs require more fuelwood to produce the same amount of energy as ICs. TC users have a greater need for fuelwood and face more stress with regard to fuelwood collection. Most TC users do not have the same knowledge as IC users about which types of wood are better or worse for fuelwood consumption. As a result, they collect whatever fuelwood and other sources of fuel they can find for their cooking needs. In the rainy season, TC users have difficulty finding sufficient fuelwood supplies.

Sources of fuelwood for household consumption

Of the households with improved chulla stoves, 76% gather most of their fuelwood from the forest while 24% have sufficient trees on their homestead to meet the majority of their fuelwood needs. In contrast, of those respondents who use traditional stoves, 84% said they depend mainly on the forest for their fuelwood, 12% reported they primarily obtain fuelwood from their own homesteads, and 4% said that they go to the market to purchase most of their fuelwood. From these findings, it is evident that improved chulla users have a somewhat reduced level of

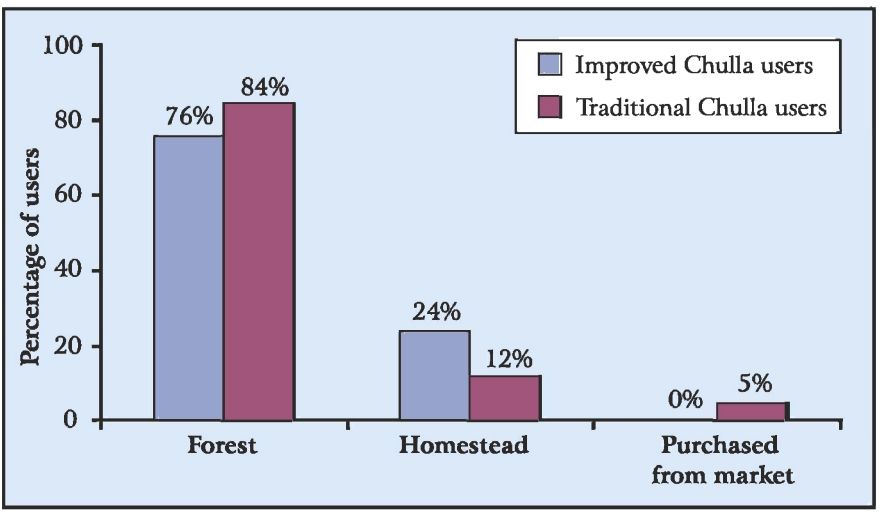

Figure 1: Primary sources of fuelwood for both IC and TC users

household dependence on the forest for fuelwood, and that improved chulla users' households are better able to meet their fuelwood needs from their own homesteads. Not going into the forest to collect fuelwood is a matter of prestige for some people and they will try to avoid collecting from the forest despite being in a vulnerable socioeconomic situation. The primary sources of fuelwood for household consumption for both IC users and TC users are shown in Figure 1.

Frequency of fuelwood collection

A comparison of the frequency of fuelwood collection from the forest between IC users and TC users is shown in Figure 2. The responses from the IC users showed that 24% do not collect fuelwood from the forest, 52% collect fuelwood once a week, and 24% collect fuelwood twice a week or more. Interviewees cooking with traditional stoves collect fuelwood more often, with only 16% not collecting wood from the forest, 9% going to the forest to collect once a week, and 75% collecting two or more times a week. Many households are located very close to the forest. Because they are in an extremely poor economic condition, they collect fuelwood for both family consumption and for sale.

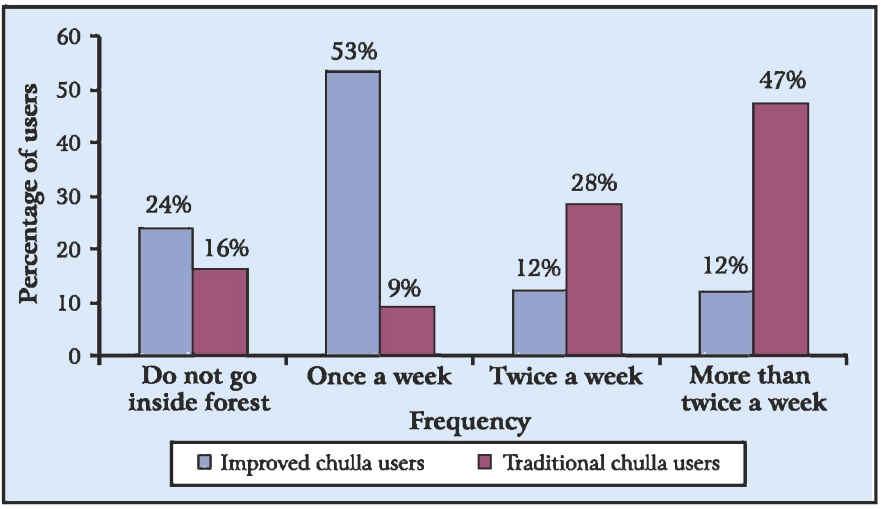

Figure 2: Frequency of fuelwood collection from the forest

Individuals who received an improved chulla from NSP were also given information about conservation measures related to fuelwood collection. As a result of their

increased awareness, owners of the improved chullas are generally more likely to use fuelwood in a more sustainable way. In addition, after learning of the benefits of improved chullas, many traditional stove users have expressed an interest in installing these stoves in their own homes.

About 65% of IC users said that they collect approximately 10 kg of fuelwood per trip into the forest, whereas 12% collect about 20 kg per trip. In contrast, 63% of TC users say they collect 20 kg or more per trip, while only 21% report collecting approximately 10 kg. These results, shown in Figure 3, reveal that improved chulla users collect less fuelwood than TC users.

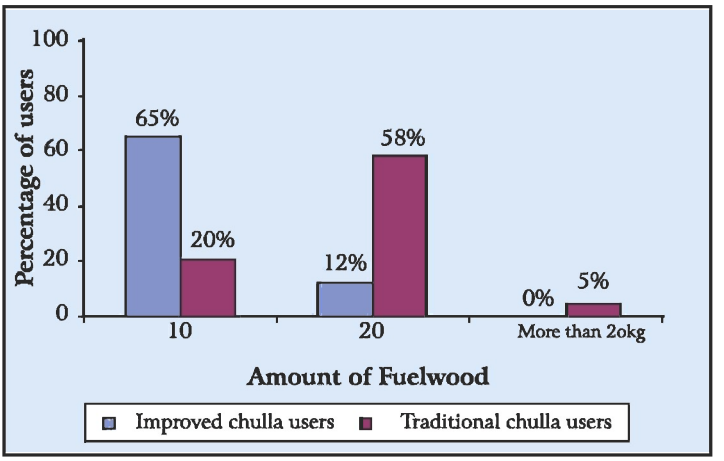

Figure 3: Average daily collection of fuelwood by households

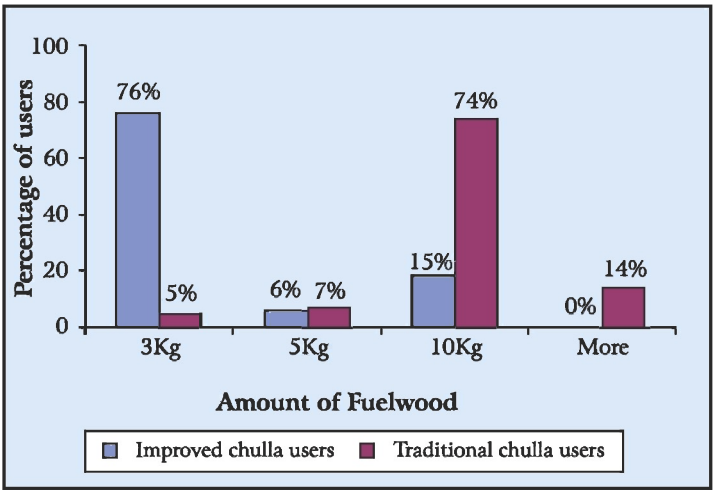

Figure 4: Average daily consumption of fuelwood by IC user and TC user households

Among IC users, 76% of households said they consume approximately 3 kg per day, compared to only 5% of TC users. In contrast, 74% of the TC users said they consume about 10 kg of fuelwood per day, which is the highest percentage between the two groups. In practical use, the majority of users recognized that the improved chulla requires only a few kilograms of fuelwood per day, whereas a traditional chulla typically requires about 10 kg of fuelwood per day. The relative daily consumption of fuelwood for the two groups is shown in Figure 4.

Selling of fuelwood

Forty-seven percent of TC users reported that they sell fuelwood whereas only 6% of IC users said they do. Overall, only 12% of users of improved chullas reported selling 40 kg or more whereas 40% of the TC users sell 40 kg or more. The distribution of fuelwood selling by those interviewees who reported selling fuelwood two times or more a week is shown in Figure. 5.

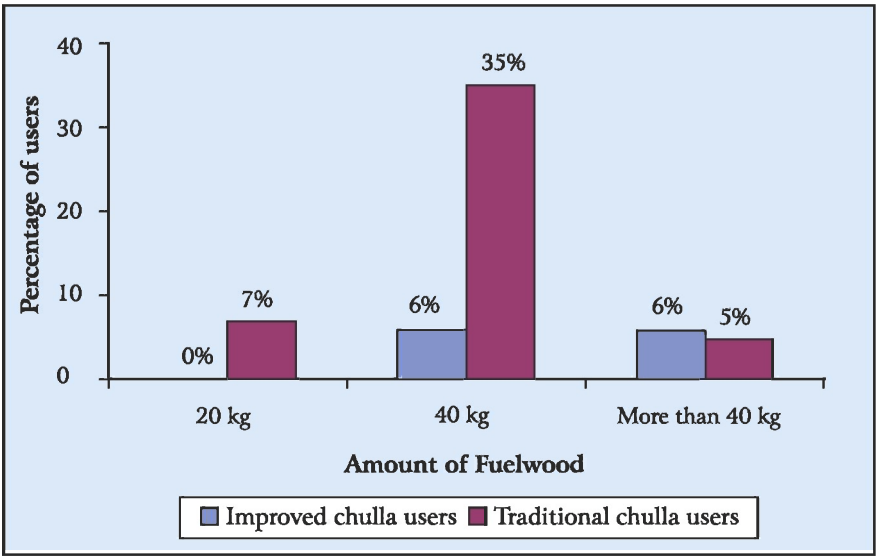

Figure 5: Fuelwood being sold per week by traditional and improved chulla users

Comparing the selling patterns of the two groups, I can conclude that there is a clear relationship between improved chulla usage and decreased engagement in the

fuelwood trade. Specifically, the use of improved chullas seems to coincide with less fuelwood collection in the study area, while those who do not use improved chullas are more engaged in illegal trade. One of the reasons why chulla users are less involved in fuelwood collection is that they also receive more support for alternative income generating activities from NSP than other people in the communities. From this analysis, we can conclude that the use of improved chullas helps to reduce pressure on forests because the stoves consume less than half as much fuel as traditional open fires (Practical Action 2007). Thus, the introduction of improved chullas is a vital tool for reducing pressure on forests.

Fuelwood transport

Regarding how fuelwood is transported for sale in the market, the study results reveal that users of traditional stoves rely more on motorized transport. The reliance on motorized transport of fuelwood indicates a higher volume of sales. Of the traditional chulla users that were interviewed, 35% use vehicles to transport fuelwood to market, 11% carry fuelwood on their shoulders. Among IC users, 5% carry fuelwood to the market with the support of their head, shoulders and the help of vehicles.

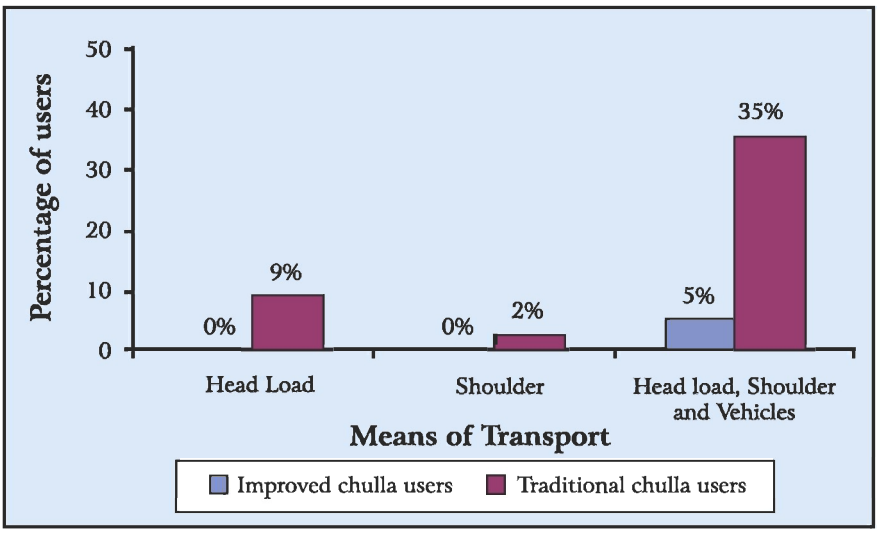

Figure 6: Means of transporting fuelwood to the market for sale

For some, a middleman is involved in the sale of fuelwood. These middlemen have a certain level of power and local FUGs are sometimes forced to sell fuelwood to the collector. If any FUG member sells fuelwood to a middleman, then they receive only about 1 BDT per kg, which is a very negligible amount. However, the middleman can travel long distances with the support of vehicles and receive a high price for the fuelwood. The different means of transporting fuelwood to the market for sale among IC users and TC users is shown in Figure 6.

Conclusion

The primary purpose of this study was to describe an overall scenario for improving local people's livelihood status and reducing their fuelwood dependence through the introduction of improved chullas in the communities surrounding Chunati Wildlife Sanctuary. This study highlights the effectiveness of the improved chulla program in minimizing the fuelwood dependence of local poor.

This study found that all of the female FUG members that were interviewed were primary users of forest resources. Although everyone depends on fuelwood for their household needs, the IC users were found to collect fuelwood on a more limited scale than TC users. During the dry season, IC users collect more fuelwood than during the rainy season and then store it for future fuelwood consumption. On the other hand, traditional stove users do not plan ahead for collecting fuelwood because they are dependent on traditional chullas and collect fuelwood wherever and whenever they find it. TC users lack the knowledge and training about the advantages of improved chullas and fuelwood collection that the IC users have received. As a result, traditional stove users are more likely to face difficulties regarding fuelwood collection and shortages.

Results further reveal that both groups depend substantially on the forest for fuelwood collection and consumption. However, TC users are much more reliant on the forest than IC users. It was also found that IC users discourage illegal trading of fuelwood. Some FUGs actively discourage the practice of going inside the forest for fuelwood. It is a matter of prestige, social custom and values for some individuals, who will try to not go inside the forest to collect fuelwood even though they are in a vulnerable economic situation. The study also found that traditional stove users consistently go into the forest for fuelwood more often, are more likely to sell

fuelwood, typically sell greater quantities of fuelwood, and use greater amounts of fuelwood in their stoves than improved chulla users. All of the interviewees are directly or indirectly dependent on the forest to some extent. After learning the advantages of the improved chullas, traditional stove users expressed an interest in installing improved chullas in their homes in order to reduce fuelwood consumption.

Concerning the differences in fuelwood sales between the TC and IC user groups, I conclude that there is a significant relationship between improved chulla use and the declined engagement in the illicit fuelwood trade. The introduction of more improved chullas would result in less participation in fuelwood collection for both household consumption and trade, and therefore less pressure on the forest. This is because improved chullas consume less than half as much fuel as traditional open fires (Practical Action 2007). More TC users are involved with illegal trade of fuelwood as a profession. Thus, the introduction of improved chullas is vital for reducing forest degradation and encouraging people who are involved in the fuelwood trade to reduce their participation in this illegal activity.

During the last two years, the improved chulla has been an important part of NSP's co-management activities in Chunati Wildlife Sanctuary. They have provided stoves and training on their use to the FUGs living inside CWS. Furthermore, FUG members have shown an interest in installing improved chullas after seeing the advantages of such chullas from their neighbors. However, due to the high cost of installing chullas, many households cannot benefit from this technology. As a result, some FUG members continue to extract fuelwood from the forest of the sanctuary. Therefore, NSP policy should be adapted to make improved chullas more widely available to people of all income levels, especially the very poor. In this way, joint efforts between NGOs and the government of Bangladesh can play a vital role in reducing the physical and financial costs of securing reliable, efficient energy – especially for the forest-dependent poor. Therefore, the government should take immediate action regarding improved chullas and promote coordination among organizations that are already working on this issue. In the long run, improved chullas can help enhance the livelihoods of local communities while reducing their dependence on forests in CWS and other protected areas of Bangladesh.

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Evaluating Co-Management as a Tool for the Reduction of Poverty and Inequality in Chunati Wildlife Sanctuary

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Abstract

Natural resource management in most developing countries has been characterized by a top down approach where people have not been involved in the process of project implementation. Such practices have been common in the case of Bangladesh. Recently, however, the Government of Bangladesh adopted co-management, a more people-oriented approach for the management of protected areas, with the aim of improving the income and livelihoods of local populations, and thereby securing their cooperation in conservation efforts. The imperative of incorporating local people's needs and knowledge into the conservation equation was learned from the failures of previous integrated conservation and development projects (ICDPs). In this study, I assessed the impact of co-management on poverty and inequality of the population surrounding a protected area in Bangladesh: Chunati Wildlife Sanctuary. I found that poverty was reduced and that resources were more equally distributed among the members of forest user groups (FUG) than among individuals not belonging to these groups. The results of this study may prove useful to the Forest Department and the Government of Bangladesh in helping them to reconcile their agenda of poverty alleviation and conservation of biodiversity through effective, collaborative management of natural resources.

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Introduction

Effective protected area management is essential for the long-term conservation of natural and biological resources, ecosystems and the threatened species that rely upon them. Past research on integrated conservation and development projects (ICDPs) suggests that protected areas will have limited future prospects in achieving these outcomes without the cooperation and support of local people (Wells 2004). Researchers and governments are now conducting studies to discover the barriers and opportunities for poverty reduction presented by co-management initiatives in protected areas, especially in developing countries (Scherl 2004).

Dire poverty and inequality are major development challenges faced by Bangladesh. In the past couple of decades, the Government has adopted various programs and policies to fight poverty. As a result, poverty was reduced at a rate of 1% per year between 1992 and 2000. Inequality, however, has increased considerably during this same period (Sen 2003). A growing body of literature indicates that high initial wealth inequality can dampen subsequent economic growth and, hence, the pace of poverty reduction (Ray 1999).

Over the past few decades, Bangladesh has shifted natural resources management from a traditional, top-down approach, with a lack of local participation, to a more people-oriented strategy. The Forest Policy of 1979, amended in 1994, supports social forestry, a participatory management approach aimed at "active participation by the rural people in planning, implementation and benefit sharing of tree growing schemes" (Taskforce 1987:1). However, social forestry has only been practiced in Bangladesh since 1998, and only in an experimental form. Thus, the role of social forestry in poverty reduction has neither been clarified nor explored in depth. Rather, the focus of most social forestry programs and research has been on the impact of poverty and social issues on the forest.

In February 2004, the Government of Bangladesh officially adopted a co-management approach for protected area management by initiating support for the Nishorgo Support Project (NSP). One of the objectives of NSP, based in five initial pilot sites, is to improve the income and livelihoods of people living in and around protected areas. In this study, I examined the contribution of NSP's

co-management efforts and activities to the reduction of poverty and inequality in Chunati Wildlife Sanctuary (CWS). I measured poverty on the basis of respondents' self-assessment, and inequality on the basis of access to various resources, using the Sustainable Livelihoods Approach (SLA), as described by Ashley and Carney (1999). This study seeks to help policy makers to design more effective poverty alleviation programs in the context of protected area (PA) management in Bangladesh. The study supports the consolidation of resources from different government programs and departments into a single model known as "co-management", to better achieve the dual goals of poverty alleviation and nature conservation.

Background

Poverty, inequality and resource degradation in Bangladesh

As in many other developing countries around the world, poverty has proved to be one of the major development challenges facing Bangladesh. In the 1970s, following the War of Independence, despite various government-initiated programs and strategies, poverty and inequality were extremely high in Bangladesh. Throughout the 1980s, the official logic was that poverty could be reduced only by increasing income levels, but results were not satisfactory. In 1992, almost 59% of the total population was still living under the national poverty line. During the 1990s, however, policy-makers' perspectives on poverty reduction began to change. They began to view poverty as a multi-dimensional problem requiring long-term, multi-pronged solutions. This shift in perspectives resulted in a reorientation of strategies that produced a poverty reduction rate of one percent per year between 1992 and 2000. However, aggregate poverty rates remain dauntingly high, pockets of extreme poverty persist, and inequality is a rising concern. Furthermore, there is a clear link between chronic poverty and unfavorable agricultural environments, such as high salinity, flooding, river-erosion, and drought (GoB 2005). Consequently, the poor have become more dependent on public commons, such as wetlands and forests. In 2000, the United Nations Development Programme (UNDP) declared a set of ambitious Millennium Development Goals (MDGs) for developing countries, to be achieved by 2015. Bangladesh has also prepared its own 'Poverty Reduction Strategy Paper (PRSP)' focusing on the impact of activities in various sectors on poverty.

According to the World Bank (2002), the Bangladesh Human Development Report (BIDS 2000), and Nasreen *et al.* (2006), the drawbacks and future challenges for Bangladesh's poverty alleviation programs can be summarized as follows:

- Political and economic inequality distorts capacity for their implementation.
- Performance monitoring systems do not exist for public sector agencies engaged in such programs.
- Government agencies are ineffective, with limited accountability, and are therefore unable to deal with backlogged and emergency needs of the
- people.
- NGOs have turned themselves into business organizations.
- The formal financial sector remains effectively on the sidelines, delivering services mainly to the non-poor, while micro-credit programs fail to reach the extreme poor.
- There is a need to enable the poor to participate more actively in economic activities through initiatives to facilitate their access to credit, land and labor.

Studies in Bangladesh have revealed that considerable spatial variability exists in the case of poverty. For instance, the incidence of rural poverty is found to be higher than that of urban poverty (GoB 2005, Sen 2003). Currently, around 85% of Bangladesh's poor live in rural areas (GoB and UN 2005). It has also been found that most rural people, especially in developing countries, rely on natural resources for their livelihoods (Dubois 2002).

Whether poverty is a result of natural resource degradation, or the reverse, remains a controversial issue. Development discourses and institutions have generally accepted that poverty and resource-degradation form a vicious cycle: overexploitation of resources by the poor triggers environmental degradation, which in turn aggravates poverty as the poor depend primarily on natural resources for their livelihoods (WCED 1987). On the other hand, according to Prakash (1997), institutional and policy constraints significantly contribute to environmental degradation. He concludes that, "The relationship between poverty and the environment is mediated by institutional, socio-economic and cultural factors".

History of co-management in Bangladesh

Local people have participated in forest management in Bangladesh through pilot projects and other experimental activities. Most of these practices have been oriented toward the planting of forests, but not necessarily toward their conservation. The first examples of participatory forest management can be traced back to 1979, through the personal initiative of Prof. A. Alim and Dr. Mohammad Yunus in Betagi and Pomora villages, Chittagong District. Under this program, each landless participant was provided with 1.62 hectares of land for growing trees and horticultural crops. The Forest Department (FD) also provided them with technical and financial assistance. Although the program was proven successful, it was not replicated in other areas due to a lack of initiative by the FD. The Government of Bangladesh first incorporated social forestry programs into its annual development planning process in 1998, and has also declared 16 protected areas (PAs) under the Bangladesh Wildlife Preservation Order, 1973. However, no effective step has been taken for the management or co-management of these areas. Several plans were formulated, but none of them have proven successful (Roy 2004). According to personal interviews and records of the FD, there are several problems with PA management approaches in Bangladesh (Roy 2004):

- The main orientation of the plans was to increase wildlife populations or to attract visitors, but almost nothing was done to compensate local people dependent on PAs for the loss of access to livelihood resources as a result of PA creation.
- Most of the FD personnel responsible for managing PAs lack adequate management capacity, training or motivation.
- Most initiatives were taken to satisfy specific donor agencies and thus lacked an integrated perspective. As a result, after the completion of
- funding, many initiatives were abandoned.
- Many of the responsible forest officers are dishonest.

The Nishorgo Support Project launched an initiative to implement co-management in protected areas in February 2004. This was the first attempt to conserve protected areas through reducing forest dependency by providing local people with alternative income generating activities. Co-management is now practiced in five

protected areas of Bangladesh. According to the co-management model practiced by NSP, a number of forest user groups have been formed. The term forest user group (FUG) refers to a group of people formed, motivated and trained by NSP for the collective management of the forest, as stated in its project goals.

Poverty and sustainable livelihoods

Carney (1998) used the term "livelihood" to refer to the capabilities and activities required for a means of living. I used the definition for sustainable livelihoods provide by Carney (1998): "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." According to Messer and Townsley (2003), "households tend to develop the most appropriate livelihood strategy by taking account of the livelihood assets at their disposal, the vulnerability context in which they operate, and the policies, institutions and processes around them." They conclude that, "poverty is the result of unsatisfactory livelihood strategies" (Messer and Townsley 2003). In other words, both poverty and livelihood strategies are linked in a circular, causal relationship. The assets that are generally recognized within sustainable livelihood theory, as summarized by McLeod (2001), include:

- Natural capital: Natural and environmental resources (land, water, wildlife, biodiversity, environmental resources).
- Physical capital: Basic infrastructure (water, sanitation, energy, transport communications), housing and equipment for productive activities.
- Human capital: Health, knowledge, skills, information and the ability to work.
- Financial capital: Financial resources from a variety of potential sources (wages, sales, remittances or pensions, savings, credit).
- Social capital: Social resources and relations (relationships of trust, membership in groups, networks, access to wider institutions).

Overview of Chunati Wildlife Sanctuary

Chunati was declared a Reserved Forest (under British India and has subsequently been managed under the reserve forest rules and regulations, according to

the Forest Act of 1927. The concept of the wildlife sanctuary was formally established through Gazette Notification on March 18, 1986, in accordance with article 23 of the Bangladesh Wildlife (Preservation) (Amendment) Act of 1974. However, Chunati Wildlife Sanctuary falls under the Wildlife Management and Nature Conservation Division through another Gazette Notification dated June 24, 2001 (Bari and Dutta 2003). The sanctuary is located at 21°40' North latitude and 92°07' East longitude, and lies about 70 km south of Chittagong (Figure 1). The total area of the wildlife sanctuary is 7,764 hectares. Some basic information about the population surrounding the sanctuary is provided in Table 1 below. Major occupations include day laborers (42% – engaged in various agricultural and non-agricultural activities to earn wages) and non-wage agricultural workers (21%), with a substantial amount of unemployed (17%) (Bari and Dutta 2003).

Table 1: Basic characteristics of the population surrounding Chunati Wildlife Sanctuary

Characteristic	Value
Number of villages	15
Total population	21,428
Male population	11,062
Female population	10,366
Number of households	3,492

(Source: BBS 1991)

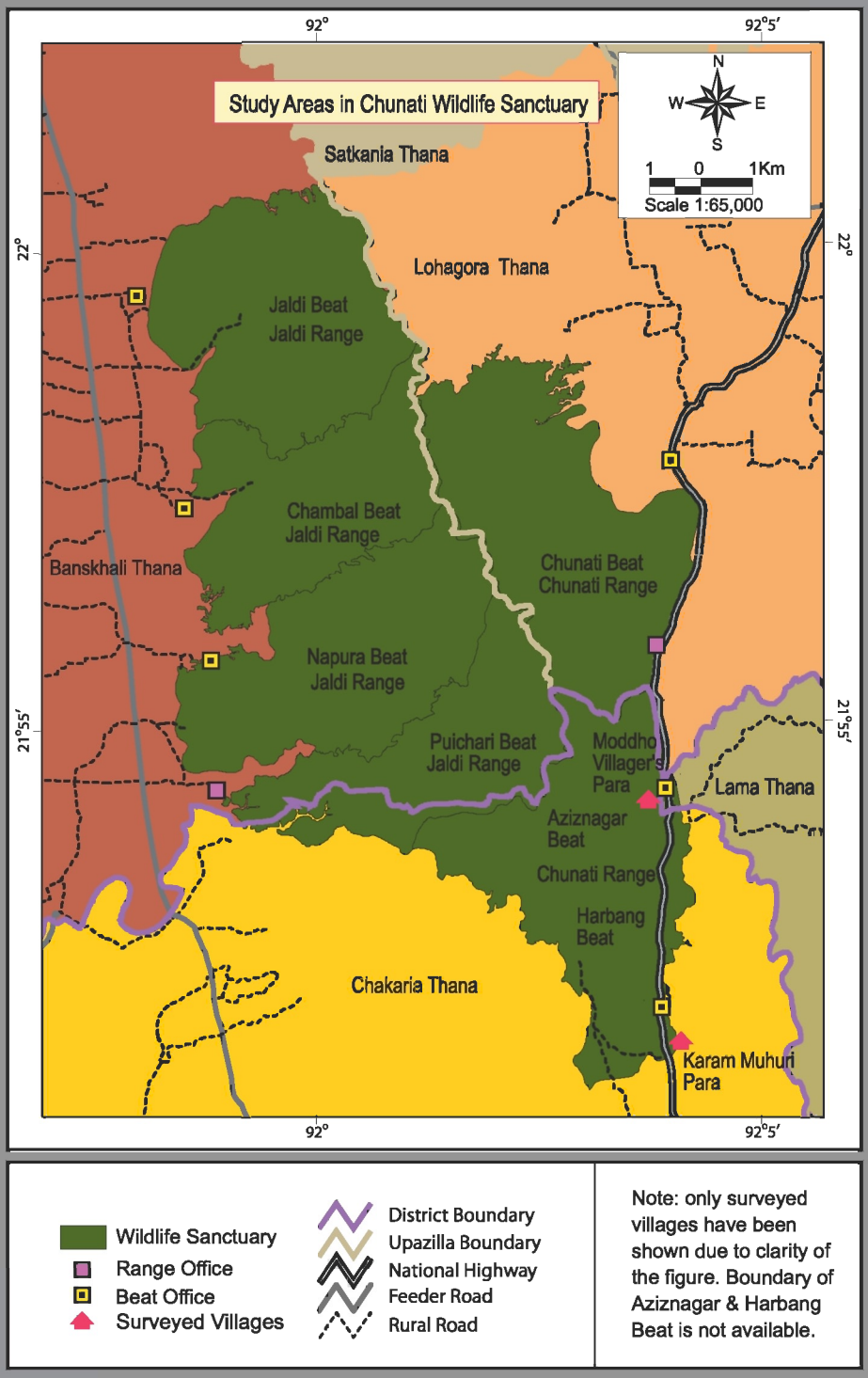

Figure 1: Map of study areas Chunati Wildlife Sanctuary

Research objective and questions

The objective of this study is to assess and compare the relative poverty situation and access to various resources and assets between members of FUGs and non-members. This objective is accomplished through the following set of research questions:

1) Poverty situation.
   Do NSP activities reduce poverty among members of forest user groups?
2) Ownership of and access to resources.
   Under this broad heading, my specific research questions are grouped according to the five "capitals" of the Sustainable Livelihoods Framework.
   - Human capital: Has the health situation of FUG members improved?
   - Natural capital: Did accessibility to land of FUG members, especially the poor, improve?
   - Financial capital: Did the income-expenditure situation of FUG members, especially the poor, improve?
   - Physical capital: Did the availability of new technologies, housing conditions, and ownership of other assets improve for FUG members?
   - Social capital: Did the social vulnerability of FUG members, especially the poor, improve? (measured as the number of sources for getting a loan)

Methodology

I used the Sustainable Livelihoods Framework (Ashley and Carney 1999) to compare poverty and inequality among members of FUGs and non-members. Here I assumed that, if other factors were equal for both members of FUGs and non-members, any differences found would be due to the activities of NSP. The term "non-members" refers to those people who depend on PAs but do not belong to any FUG recognized by NSP. Out of 37 FUGs recognized by the CWS NSP site office, I randomly selected two FUGs from two separate villages: Karam Muhuri Para and Maddha Villager Para. Maddha Villager Para is adjacent to the sanctuary and Karam Muhuri Para is located inside the sanctuary. Most people of Maddha Villager Para were settled there in the early 1950s by the FD. There has not been a lot of migration into or out of Karam Muhuri Para in recent years.

The FUG members belong to two distinct villages, so I selected non-members from these same villages for comparison. I asked the responsible field officers who organized and trained the groups to rank FUG members according to their wealth as poor, middle-income and rich. To validate these data, I conducted a wealth ranking exercise among respondents in the pilot study. Results from both ranking exercises were in agreement, and I used the resulting stratified list to randomly select six members from each of the groups in the two FUGs. I then asked each of the 18 FUG respondents to name one non-member who was at approximately the same income level that he or she belonged to before NSP was initiated and thereby selected an additional 18 non-member respondents. According to the norms established in the community, only one person from each household can join in a specific FUG. Thus, each respondent represents a separate household, at least in theory. Table 2 summarizes the sample size and the distribution of all respondents across the three wealth strata: poor, middle and rich.

Table 2: Sample size and distribution of FUG members and non-members in Maddha Villager Para and Karam Muhuri Para

Category	Poor households	Middle households	Rich households	Total households sampled	Total households in both villages
FUG members	6	6	6	18	53
Non-members	6	6	6	18	597
Total	12	12	12	36	650

I collected field data from March to June, 2007. During this period, I visited the field several times and conducted two focus group discussions among the members of each FUG. I also ran a pilot study to determine criteria by which to assess poverty in the village and to develop a wealth ranking of FUG members. On the basis of the pilot study, I prepared a semi-structured questionnaire for personal interviews. After administering the survey, I again conducted two focus group discussions with the same FUGs in order to clarify points raised in the questionnaire, gain a deeper understanding of inequality and poverty among group members, and gauge their attitudes towards NSP activities. I also conducted qualitative interviews (Messer and Townsley 2003) with four individuals to assess changes

they have experienced as a result of NSP activities. In addition, I collected survey reports from NSP, Government gazettes related to CWS, and the minutes of monthly FUG meetings as sources of secondary data.

Results and discussion

In general, the study reveals that poor members of FUGs have lifted themselves out of poverty at a faster rate than non-members. To investigate the reasons for this, I assessed the relative assets of both FUG members and non-members. I found that people of FUGs are more conscious of health-related issues than non-members, and that the financial condition of the members of FUGs was better than that of non-members over the past year. Furthermore, the level of social interaction among FUG members is stronger than among non-members, and poorer members of FUGs are much more empowered than before. Results also reveal that resources are more equally distributed among the members of FUGs than among non-members.

Poverty situation

Do NSP activities reduce poverty among members of forest user groups?

In pilot studies, people selected 'having three meals per day' as the criterion for poverty assessment. This means that someone is considered poor if he or she cannot arrange for three meals per day. I asked both FUG members and non-members to assess their situation according to this criterion. Two out of six respondents of the FUG assessed themselves as poor, compared with four of the six non-member respondents. One of the members of the FUG said, "You know that, being a poor housewife, it is not that easy to maintain a household with limited income. I could only ensure that my children were not hungry throughout the year, though we didn't save a single paisa."

To assess the possible reasons why there are fewer poor people in the FUG, I asked members to identify at least two benefits that they received from joining the group. FUG members, especially the poor, reported that they have improved their livelihoods and have better access to various services than before (see Table 3). Poor people of the FUG also reported that now they are much more respected in society than before. One inhabitant of Maddha Villager Para who is a member of the FUG and is poor said, "People used to ignore me. I was not invited to various social

functions such as wedding ceremonies. Now people invite me to various occasions." Other respondents said that it became easier for them to get a loan from the members in case of an emergency. During the focus group discussions, members of FUGs informed me that now they make decisions by discussing things with one another, including their personal problems.

Table 3: Main advantages of joining the forest user group as reported by FUG respondents

Advantage	Number of people (n=18)			
	Poor (n=6)	Middle income (n=6)	Rich (n=6)	Total* (n=18)
Improved livelihoods	6	6	5	17
Benefits the community	1	3	5	9
Social status, self-esteem	4	2	1	7
Important in times of emergency need in future	1	1	0	2
Enjoyment recreation	0	0	1	1

*NOTE: Multiple responses allowed, so the total number of responses exceeds the total sample size of 18

To validate the responses of FUG members concerning their economic status, I asked non-members whether they know anyone that has improved their socioeconomic status. Ten out of eighteen people responded that they know at least five people who have improved their socio-economic status since joining the group. The perceived prospects for improving livelihoods and socioeconomic conditions are also reflected in the fact that 77% of non-member respondents showed interest in joining a FUG.

Table 4: Non-members perception of FUG members improving their socio-economic status

Number of people known with improved socioeconomic status	Numbers of non-member respondents (n=18)
Less than three people	2
Three or four people	6
Five people or more	10

These findings suggest that NSP has indeed enhanced the livelihoods of FUG members and that FUG membership is perceived as beneficial by non-members. Under the supervision of NSP, FUG members assessed the limitations of their own livelihoods and their desire to overcome these limitations. To build their capacity, NSP has provided training in various income-generating activities (e.g. nurseries, home gardening, cattle-rearing and improved stove making).

Ownership of and access to resources

Human capital: Has the health situation of FUG members improved?

The Government of Bangladesh (GoB 2005) identified ill health as both a major cause and a consequence of poverty in Bangladesh. It stated that the poor constitute a high risk group for ill health. There are various factors that correspond with poor health, especially for poor people: malnutrition and low levels of nutritional knowledge; high levels of illiteracy, inequitable distribution of income, exposure to unsafe drinking water and poor sanitation facilities; non-availability of efficient public health care and services; and environmental pollution and degradation. To assess human capital of both FUG members and non-members, I collected information about their sanitation systems, their sources of safe drinking water, and their disease and treatment history. I selected these variables because these issues were frequently discussed in the weekly meetings of the FUGs (FUG meeting minutes). Generally, I found that FUG members are more conscious about health-related issues than non-members. Table 5 reveals that the percentage of people with knowledge about 'the importance of using sanitary toilets' is generally higher among members of FUGs than among non-members. Furthermore, most FUG members reported going to a health clinic or to a private physician, whereas non-members rely more on traditional methods. To find the reasons for such heightened consciousness among FUG members about health (summarized in Table 5), I went through the minutes of the monthly meetings of FUGs. I found that they discussed various issues, like the importance of safe drinking water, hygienic measures, child education and environmental conservation.

Table 5: Knowledge about health-related issues among FUG members and non-members

Knowledge category	Poor		Middle income		Rich	
	FUG	Non-FUG	FUG	Non-FUG	FUG	Non-FUG
Importance of using sanitary toilets	5	0	6	4	6	6
Importance of using safe drinking water	6	5	5	6	6	6
Necessity for modern medical treatments	6	0	5	4	6	5

One of the poor members of a FUG said, "Now we are much more aware about the health facilities provided by the government. Last year one of my daughters was severely sick. She caught a cold that led to pneumonia. [Another community member] told me to go to the local health complex. Doctors diagnosed the disease and prescribed some medicine. Though I bought the medicine from outside, it worked well and she became well very soon."

Sen (2003) found ill health to be the second most important cause of people slipping into poverty from a non-poor situation. In the study sites at CWS, I found that during the previous year the incidence of disease was lower among FUG members than among non-members (see Table 6). This may be partly due to FUG members' greater knowledge about and access to safe water sources and sanitary toilets.

Table 6: Disease incidence among FUG members and non-members by wealth status

Groups	Poor	Middle income	Rich
FUG members (%)	67	83	67
Non-members (%)	83	100	100

Natural capital - Did access to land by FUGs members, especially the poor, improve?

To assess the natural capital of FUG members and non-members, I calculated the total land accessibility of the respondents: (size of homestead) + (amount of own agricultural land) + (amount of agricultural land borrowed from others) – (amount of agricultural land lent to others). Based on these calculations, I found that the

average land accessibility of poor FUG members (80 decimals) is significantly higher than that of poor non-members (19 decimals) (Figure 2). On the other hand, average land-accessibility of rich and middle class FUG members (138 and 92 decimals, respectively) is lower relative to the poor compared to non-members (125 and 146 decimals, respectively). This suggests that land accessibility is more equal among the members of FUGs than among non-members. One possible reason for more balanced land accessibility among rich FUG members may be that they have lent land to poorer members for sharecropping.

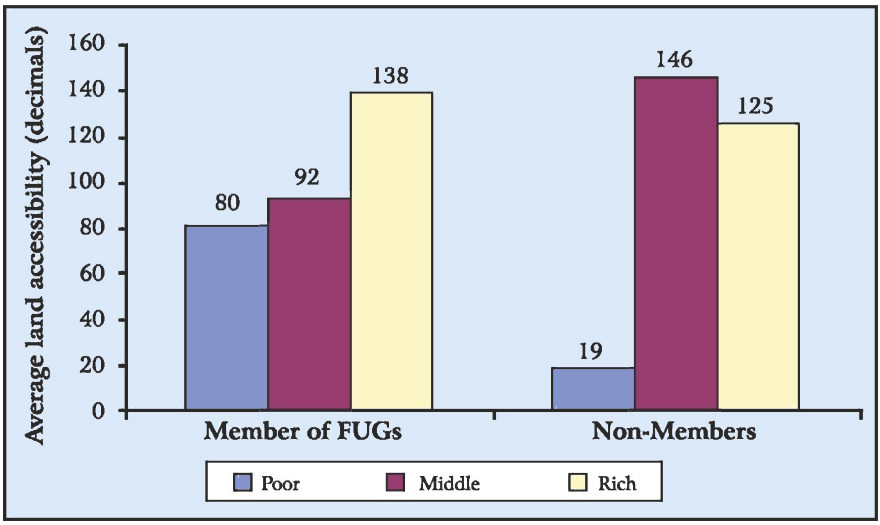

Figure 2: Average land accessibility of FUG members and non-members by wealth status

Land was found to be a very important source of income in CWS. In fact, more than half of the total population is engaged in agricultural activities. Sen (2003) also found that initial land endowment is a determinant of poverty in Bangladesh. In CWS and its adjacent areas, where people are dependent on forest to earn their livelihood and FUGs have been formed, land has become more equitably distributed among FUG members, mainly through sharecropping arrangements. Although sharecroppers generally do not enjoy secure tenure access to land, they can at least produce food for themselves.

Financial capital - Did the income-expenditure situation of the FUGs members, especially the poor, improve?

I found that the financial capital base of the members of FUGs is better, on average, than that of non-members. To assess this, I collected information on the financial condition of the respondents over the past year. Table 7 below reveals that none of the FUG members were in the 'permanently insolvent' category, whereas 27.75% of non-members were. Conversely, the percentage of people in the 'solvent' and 'income and expenditure was the same' categories was higher for FUG members than for non-members. This suggests that the overall financial condition of FUG members was better than that of non-members during the past year. "Surplus" refers to a situation in which people can save some money after spending their earnings in a relaxed way, including some expenditure for entertainment and recreation. "Solvent" refers to a financial condition in which a person can spend his or her income in a relaxed way, but may not accrue any savings. I use the term "temporary insolvent" to indicate those people who are in debt from three to nine months out of the year, and "permanently insolvent" to denote those who are in debt for more than nine months per year.

Table 7: Financial condition of FUG members and non-members during the past year

Financial condition	FUG members (%)	Non-members (%)
Surplus	33	33
Solvent	22	6
Income and expenditure was same	28	22
Temporary insolvent	17	11
Permanent insolvent	0	28

The analysis reveals that members of FUGs are not as susceptible to permanent insolvency. This may be due to the various alternative income-generating activities available through NSP. For example, NSP has provided some people with the seeds of high-yield vegetable varieties and financial grants that they used for various productive activities. As a result, these people now produce up to three vegetable crops in a year and also use their earnings to buy necessities in the local market. Another possible reason for FUG members' greater financial security is that they appear to have a higher likelihood of receiving a loan in case of emergencies (see Table 9).

Physical capital – Have housing conditions, the availability of new technologies, and ownership of other assets improved for FUG members?

I assessed physical capital of households primarily on the basis of their housing condition, the number of rooms in their house, their agricultural technology, and whether or not they own a tube well. When I went to the respondents' homes for interviews, I observed their general housing condition, and I also collected information about the number of rooms by asking them. I found that the housing condition of FUG members is generally better than that of non-members, especially among poor households. According to the housing indicator for poverty developed in the pilot study (i.e., a mud wall with a sungrass roof is an indicator of extreme poverty), FUG members have escaped the situation of extreme poverty. While talking about her housing condition, one female FUG member noted, "Our house, which was made of mud and sungrass, collapsed around one and a half years ago after a spell of intense rain. [Other community members] helped us by providing bamboo and voluntary labor. Then we remade our house with bamboo walls and tin. Now we do not have any problem during the rainy season."

I also observed that almost all of the FUG members use specific agricultural technologies, such as high-yielding seed varieties or cow fattening techniques. On the other hand, only a few non-members use high yielding seeds in their fields. Another female FUG member said, "We used the seeds provided by NSP and harvest more vegetables than before." She also noted that now she can help her husband in the field, since she has received vegetable cultivation training from NSP.

In addition, I found that members of FUGs generally have a more reliable water source than non-members, and are much more aware of the importance of using safe drinking water. For instance, when I asked them whether they own a tube well or not, I found that more FUG members than non-members own such a well (see Table 8).

Table 8: Tube well ownership among FUG members and non-members by wealth status

Responses	Poor		Middle income		Rich	
	FUG	Non-FUG	FUG	Non-FUG	FUG	Non-FUG
Own tube well	3	1	4	3	6	5
Do not own tube well	3	5	2	3	0	1

Social capital - Did the social vulnerability of FUG members (measured as the number of sources for getting a loan), especially the poor, improve?

To assess the social capital of both FUG members and non-members I collected information about their vulnerability and empowerment status. Since the poor are more vulnerable to socioeconomic shocks than other members of society – due to their inadequate resources to prepare them for long-term recovery from shocks (GoB 2005) – I gathered information about only poor FUG members and poor non-members. Generally, I found that poor FUG members are less vulnerable than poor non-members, because in the case of an emergency they can generally rely on other FUG members for help (Table 9). I classified poor respondents into three groups on the basis of their response as "vulnerable" (less than three people will help in case of emergency), "moderately vulnerable" (three to five people will help in case of emergency) and "not vulnerable" (more than five people will help in the case of emergency).

Table 9: Number of poor FUG members and non-FUG members who reported others would help them in case of an emergency

Category of vulnerability (number of helpers in case of emergency)	Number of poor FUG members (n=6)	Number of poor non-members (n=6)
Vulnerable (0-3)	1	3
Moderately vulnerable (3-5)	1	1
Not vulnerable (more than 5)	4	2

Conclusions and recommendations

Overall, I found that poverty was less prevalent among members of FUGs than among non-members in Chunati Wildlife Sanctuary. Although we cannot be sure that there is a direct cause-and-effect relationship between FUG membership and poverty reduction, or that some socioeconomically marginalized households were not excluded from FUGs in the first place, the evidence from this study suggests that socioeconomic well-being may be enhanced by group membership. Access to natural resources, specifically land, is greater for those poor who belong to FUGs. Their overall financial condition was also better during the past year. Furthermore, due to NSP activities, new technologies have become more available to FUG members and their housing conditions have improved. Finally, FUG members are

generally more financially secure than non-members. It is likely that members of FUGs have uplifted their socio-economic condition by using the knowledge and support provided by NSP. It also appears that inequality among the members of FUGs may have been reduced due to group interaction, knowledge acquisition, and the redistribution of resources among themselves, although further research is necessary to substantiate this.

The Government of Bangladesh's claim that skills and knowledge of the household head is a major contributing factor in reducing poverty (GoB 2005) seems to be supported by the findings of this study. As such, the results may be useful in designing poverty alleviation programs that incorporate the agenda of biodiversity conservation in and around protected areas. To corroborate and expand upon these results, further studies should be conducted in various geographical contexts, including longer-term assessments using indicators employed in this study and others. Finally, the findings suggest that donor agencies that have previously funded poverty alleviation and nature conservation under separate programs could combine their support under the integrated sector of co-management of natural resources.

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Assessment of Human Well-Being under Co-Management Initiatives in Chunati Wildlife Sanctuary

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Abstract

Forests render both a home and a livelihood for people living in and around them. To reconcile the needs of local communities with conservation, the Nishorgo Support Project is supporting co-management in five protected areas of Bangladesh, including Chunati Wildlife Sanctuary. In these protected areas, the assessment of human well-being is of central concern. This study seeks to assess the well-being of three main groups of stakeholders (collectors, betel-leaf cultivators, and forest villagers) participating in the co-management activities of the Nishorgo Support Project in Chunati Wildlife Sanctuary by answering three fundamental questions: (1) "Is co-management effective in promoting maintenance of and access to resources?" (2) "Do forest actors enjoy a reasonable share of the economic benefits derived from forests?" and (3) "Do people link their own and their children's future with the management of forest resources?" Various frameworks have been formulated to assess human well-being. This study employs a set of methods developed by the Center for International Forestry Research to assess three main areas of well-being: (1) intergenerational access to resources; (2) means and rights to manage forests; and (3) health of forests, forest actors, and their cultures. Findings reveal that intergenerational access to resources is not ensured, though stakeholders have clearly acknowledged rights and means to manage forests. In addition, local stakeholder groups do not seem to have serious conflicts within and among themselves. Despite these and other promising results from co-management, it is evident that human well-being is being compromised in Chunati Wildlife Sanctuary. I conclude that Nishorgo's conservation efforts will only succeed if local people can truly benefit, thereby ensuring their well-being. In this regard, Nishorgo's initiatives to establish and ensure the full functioning of Co-management Councils and Committees can play a momentous role.

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Introduction

Forests render both a home and a livelihood for people living in and around them. They can serve as vital safety nets, aiding rural people to rise out of poverty (Sunderlin *et al.* 2003). An intricate relationship exists between forests and people, especially surrounding protected areas (Sayer 2000), and cooperation among stakeholders is likely the only way that sustainable forest management can be achieved. Therefore, in protected areas (PAs) where collaborative management (co-management) is being implemented, the assessment of human well-being is of central concern. There have been many formulations and definitions of human well-being (Alkire 2002). Furthermore, the concept of well-being is relative to a specific socio-cultural and geographical context, and can change with time, according to what people value being and doing. The Millennium Ecosystem Assessment (2003) provided a broad definition of well-being, which focuses on social, physical, mental, and spiritual aspects, and characterized well-being as a situation-dependent state. Lamb (2003) refers to human well-being as a measure of ecosystem services.

Well-being is multidimensional, dynamic, complex and context-dependent (Narayan *et al.* 2000a; Narayan *et al.* 2000b). Colfer *et al.* (1995) define well-being according to four dimensions: (1) security and sufficiency of access to resources; (2) incorporation into a network of other human beings who participate in a common cultural system; (3) justice; and (4) health and safety. Later, Colfer *et al.* (1999a) expanded this definition to include intergenerational access to resources; means and right to manage resources; and health of forests, forest actors, and cultures. Finally, Colfer *et al.* (2001) explained human well-being as an aggregation of security and sufficiency of access to resources now and in the future, economic opportunity, decision-making opportunity, heritage and identity, justice, and health and safety. This study uses these definitions provided by Colfer *et al.* (1999a, 2001) to delineate a conceptual framework that places human well-being within the context of sustainable forest management. Due to an increased focus on human well-being, the management of PAs has undergone a shift from the traditional 'blueprint' paradigm to a more collaborative and participatory approach. The Nishorgo Support Project (NSP or Nishorgo) has initiated co-management in five PAs of Bangladesh, with the aim of assisting local people to improve their

livelihoods, through greater access to and control over local forest resources. This entails addressing longstanding inequities in forest management, especially with regard to state land. Thus, co-management is increasingly seen as a tool for empowerment and promoting social justice, especially where inequities are blatant. Mayers *et al.* (2005) defined co-management as "the equitable access to resources and the benefits of management activities usually carried out though [a] collaborative approach that improves human well-being".

Various frameworks have been formulated to assess human well-being within the context of environmental conservation (Millennium Ecosystem Assessment 2005; Moiseev *et al.* 2002; Prescott-Allen 2001). The Center for International Forestry Research (CIFOR) has developed a set of methods to measure the well-being of forest-dependent stakeholders based on results from systematic studies in Cameroon, Indonesia, and Brazil, and supplementary work in Thailand, Gabon, and the United States (Colfer *et al.* 1999a). These methods assess three main areas of well-being: (1) intergenerational access to resources; (2) means and rights to manage resources; and (3) health of forests, forest actors, and cultures. This case study uses the CIFOR methods (Colfer *et al.* 1999a; Colfer *et al.* 1999b; Salim *et al.* 1999) to assess the well-being of three groups of stakeholders – collectors, betel-leaf cultivators, and forest villagers – participating in the co-management activities of NSP in Chunati Wildlife Sanctuary (CWS). As such, it provides a baseline for future research, by facilitating comparison of future and current human well-being, and seeks to guide policy-makers – in international, regional and local organizations (especially the NSP implementing body) – and researchers working on human well-being issues in the context of PA management. The results of this study suggest that human well-being is being compromised in CWS.

Background

Site description

CWS was declared a PA in 1986. The area covers about 7,763 ha (NSP 2006) in two Forest Ranges (Jaldi and Chunati) under the Chittagong Wildlife and Nature Conservation Division. These ranges are divided into seven Forest Beats. The Chittagong–Cox's Bazaar Highway crosses the eastern part of the sanctuary.

Figure 1 shows the location of the sanctuary and its land-use patterns. CWS belongs to the Tropical Evergreen and Semi-Evergreen Forest Biogeographic Zone, representative of the biodiversity of the northeastern subcontinent, with hilly to mountainous areas ranging from 30–90 meters in elevation (Mollah *et al.* 2004). Since its establishment, Chunati has seen more research activity and positive attention than any other PA in the country. At present, there is little natural forest left, with only a few scattered patches of Garjan (*Dipterocarpus spp.*). Since designation as a PA, CWS has become substantially degraded due to heavy human interference. Many low-lying areas and valleys have been converted to paddy cultivation (Mollah *et al.* 2004). The management plan for CWS identified a 5-kilometer-wide landscape (buffer) zone around the sanctuary (NSP 2006). Vast areas of paddy lands and settlements are found throughout the sanctuary and the adjacent reserve forest. Most of the local population uses forests to meet their consumption and income needs.

Stakeholders and their livelihoods

There are 70 settlements (paras) with approximately 7,810 households located in and around the sanctuary (Mollah *et al.* 2004). Nearly half (48%) of these households are situated inside the sanctuary and the rest are located adjacent to or near the sanctuary. About 64% of the households are extremely poor and the rest are either poor or middle class (Mollah *et al.* 2004). On average, 40% of the households are landless and 30% are unemployed. Nearly three-fourth of the total inhabitants depend on CWS for the collection of various primary forest products (ibid). Mollah *et al.* (2004) identified 24 categories of stakeholders, including 19 primary groups and 5 secondary groups, with an interest in the sanctuary. Fuelwood collectors, bamboo collectors, betel-leaf cultivators, and land encroachers were among the primary stakeholders. According to the local people and Forest Department (FD) staff, about 6,000 people (30% of the households) living in and around the park are involved in betel-leaf cultivation (Mollah *et al.* 2004). As a result of this and other activities, human pressure on the forests is quite high. This heavy dependence on forests and forest land has resulted in an active opposition by local people to wildlife conservation efforts.

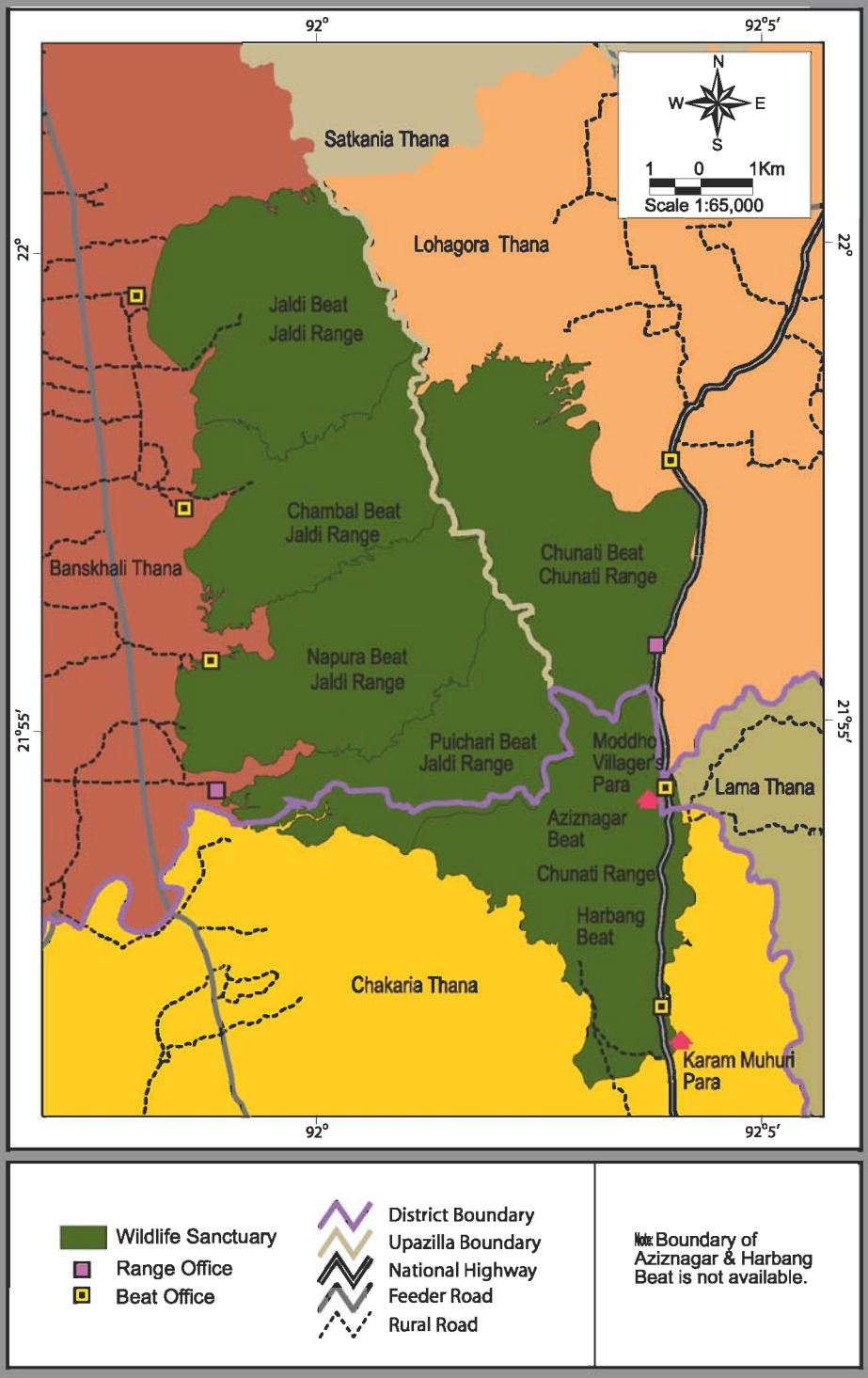

Figure 1: Map of Chunati Wildlife Sanctuary with resources, buffer zone and sample areas

Co-management institutions

Nishorgo, a partnership between the FD and the United States Agency for International Development, is responsible for introducing co-management in the area surrounding CWS and other PAs of Bangladesh. The local entities responsible for carrying out co-management are the Co-management Councils (Councils) and the Co-Management Committees (Committees). Nishorgo has assisted in forming two Councils and two Committees in CWS (one each in Chunati and Jaldi, respectively). The Council and the Committee are comprised of representatives from civil society groups, local administrators, people from local villages, and representatives of various government organizations. The Council is responsible for planning, management and decision-making in CWS, including the setting and reviewing of annual action plans, the resolution of conflicts among stakeholders, the design of policies, and ensuring the fair distribution of benefits derived from the forest and co-management activities. The Committee, on the other hand, is the operational body responsible for the implementation of the decisions and plans approved by the Council.

Objectives

The broad goal of this study is to assess the human well-being of those people who depend on the resources of CWS. I have divided this broad goal into three primary objectives:

1. To assess whether co-management maintains or enhances fair intergenerational access to the resources in CWS;
2. To evaluate whether stakeholders have the appropriate rights and means to manage forests of CWS cooperatively and equitably; and
3. To learn whether the health of stakeholders, cultures and the forest is acceptable to key stakeholders in CWS.

Methodology

The study was conducted by a team comprised of three foresters, following the "Basic Assessment Guide for Human Well-Being" (Colfer *et al.* 1999a) and the "Supplementary Methods for Assessing Human Well-Being" (Colfer *et al.* 1999b). Before beginning fieldwork, we conducted a thorough review and discussion of the

methodology, including the specific criteria and indicators format. Box 1 summarizes the steps we followed. We made several initial field visits to Chunati and Jaldi ranges in order to identify the most important forest-dependent stakeholders and to plan fieldwork. During these visits, we met with FD officials, settlement heads, leaders of forest villages, and members of the Council and Committee, to select and learn about possible research locations, and to understand the situation inside and outside of CWS.

Box 1: Basic steps in the human well-being assessment methodology

1. Identification of relevant stakeholders
2. Assessment of security and intergenerational access to resources
3. Assessment of rights and means to manage forests cooperatively and equitably
4. Assessment of the health of forests, forest actors and cultures
5. Scoring and analysis of collected data or information

Identification of stakeholders

Based on the preliminary visits and an earlier stakeholder analysis conducted by Mollah *et al.* (2004), the five stakeholders with the highest forest-dependence levels were identified: (1) betel-leaf cultivators [1], (2) fuelwood/bamboo/sungrass [2] collectors (hereafter called "collectors"), (3) encroachers, (4) forest villagers [3], and (5) farmers (villagers who live in the forest and farm low-lying paddy lands) (Table 1). From these five, the three most important forest-dependent stakeholders - collectors,

[1] Betel-leaf (*Piper sermentosum*) cultivators build small frames of bamboo (structure) and sungrass (shade) where they cultivate betel leaves for the market. The frame is usually constructed on the bottom slope of a hill to facilitate good drainage.

[2] Sungrass (*Imperata cylendrica*) is a low-cost material used especially for roofing. It is readily available/sellable in the market.

[3] "Forest villagers" are those people who were settled by the FD in 1952 in what were then reserve forests. In exchange for assisting the FD with forest maintenance chores, they received the right to collect and/or cultivate specific products (e.g. betel leaves, bamboo, sungrass, fuelwood and paddy) in certain low-lying areas of the forest. They have considerable knowledge about local ecological, social and forest management conditions, as well as program implementation. All of the study's respondents were forest villagers. Some now reside in areas adjacent to, but technically outside of, CWS. They work as betel-leaf cultivators, collectors, farmers, and in a variety of other professions. Thus they overlap with other resource-based categories of stakeholders.

betel-leaf cultivators, and forest villagers (practicing a variety of economic activities) – were selected using the 'who counts matrix', based on seven dimensions: (1) proximity to forests; (2) pre-existing rights; (3) dependency on forest resources; (4) poverty; (5) indigenous knowledge of their local resources; (6) cultural link with the forests; and (7) power deficits (Table 1). The team randomly chose three study sites – Harbang, Aziznagar, and Jaldi (Figure 1) where each team member independently conducted focus group discussions with members of each of the three stakeholder groups in the three villages (for a total of 27 focus group discussions). The team members were assisted in the focus group discussions by a qualified community member, selected by the focus group participants, or by a Nishorgo site facilitator[4]. These assistants helped in data recording only.

Table 1: Identification of key stakeholders in Chunati Wildlife Sanctuary using the "Who Counts Matrix" (Colfer 1995, Colfer *et al.* 1999c)

Dimensions*	Stakeholders				
	Encroachers	Betel-leaf cultivators	Forest villagers	Farmers	Collectors
Proximity	2	1	1	2	1
Pre-existing rights	3	1	1	1	1
Forest dependency	3	Variable	1	2	1
Poverty	2	3	3	3	1
Indigenous knowledge	2	Variable	1	2	Variable
Culture - forest link	3	1	1	2	1
Power deficit	Variable	2	3	2	1
VALUE	2.14	1.14	1.57	2.00	0.86

*Note: 1=High, 2=Medium, 3=Low, Variable = Uncertain ranking, depending on field experiences.

Assessment

To assess the well-being of selected stakeholders, we followed CIFOR's human well-being assessment guides (Colfer *et al.* 1999a; Colfer *et al.* 1999b; Salim *et al.* 1999). Two basic methods were used: the Histo-Ecological Matrix (to assess intergenerational access to resources) and the Pebble Distribution Method (PDM) (to assess both generational access to resources and benefit-sharing among stakeholders) (Colfer *et al.* 1999a; Colfer *et al.* 1999b). The PDM is a tool for comparing the relative importance of different factors or time periods, based on the number of pebbles that respondents allot to each factor or time period. Data were collected

[4] A 'Nishorgo Site Facilitator' is responsible for coordinating local participation in the implementation of Nishorgo program activities in specific areas/sites.

through focus group discussions and both pebble distributions and opinions expressed during the exercise were recorded. To assess stakeholders' rights and means to manage resources, we also followed the methods established by Colfer *et al.* (1999a). [5] We assessed the remaining indicators concerning the health of stakeholders, their culture, and the forests through open-ended discussions and personal visits to different areas of CWS, as suggested by Colfer *et al.* (1999a). For overall assessment of human well-being in CWS, team members used the 'Social Criteria and Indicators' sheet of Colfer *et al.* (1999a), with some modifications to fit local conditions, to record scores ranging from 1 to 10, as per Salim *et al.* (1999). Each team member conducted the scoring independently based on experiences from all field visits, focus group discussions, individual interview and personal judgments. Data were analyzed using SPSS statistical software (version 13) and Microsoft Excel 2003.

Results

Assessing intergenerational access to resources and economic benefits

This section addresses three main questions: (1) "Is co-management effective in promoting maintenance of and access to resources?" (2) "Do forest actors enjoy a reasonable share of the economic benefits derived from forests?" and (3) "Do people link their own and their children's future with the management of forest resources?" The evidence for each of these questions is presented in detail below.

1) Is co-management effective in promoting maintenance of and access to resources?

In focus group discussions, the three selected stakeholders groups (forest villagers, betel-leaf cultivators, and collectors) were asked to score past, present and future trends in the availability of major forest products at six points in time (past and present) at 5-year intervals: 1992, 1997, 2002, 2007, 2012 and 2017. The participants themselves selected these reference years during discussions. Figure 2 shows the trends in perceived availability of various resources from the study sites during the 25-year period between 1992 and 2017. Generally, respondents perceived higher resource availability in the past (with 1992 being the highest), with decreasing availability of resources through time.

[5] However, we did not follow the exercise of form B and only the allocated pebbles and opinions expressed were recorded.

Figure 2 shows a perceived decrease in the availability of resources through time, as revealed by the average number of pebbles allotted by different groups to each year. Paddy was the single exception, showing an increase in perceived availability (in both total land cover and crop productivity) between 1992 and 2007, and then a decrease into the future. We believe the perceived increase in the amount of paddy is due to the adoption of chemical fertilizers, high yielding varieties, gravity-fed irrigation, and increases in area of coverage due to conversion of more forest land into paddy field (See Plates 1 and 2). After 2007, respondents predicted a decrease in paddy resulting from increased protection of the wildlife sanctuary by the FD and NSP. Community members also predict that fuelwood scarcity will become even more pronounced in the future relative to the other resources, as indicated by the relative steepness of the fuelwood curve, compared with those of the four other resources analyzed.

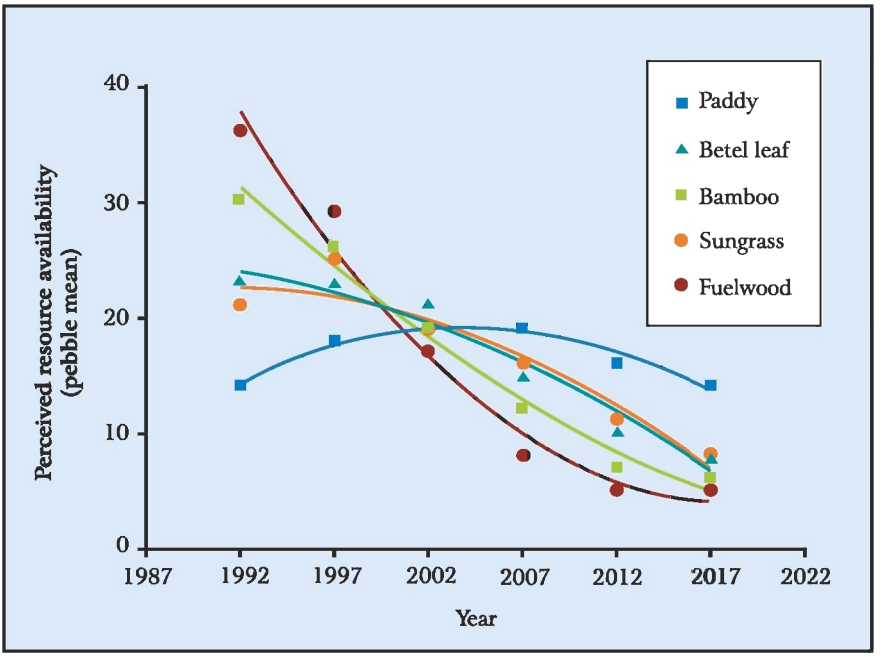

Figure 2: Perceived past, present and future availability of major forest products from Chunati Wildlife Sanctuary by three major stakeholders (using Histo-Ecological Matrix, Colfer *et al.* 1999a)

Table 2 summarizes the respondents' explanations for why forest resources are decreasing in availability. Respondents perceived the betel leaf crop to be decreasing due to rainfall scarcity, the increased price of production inputs (i.e. bamboo, sungrass, pesticides, insecticides, etc.), and government policies restricting expansion. They perceive that bamboo is becoming scarce because of intentional forest fires, unsustainable extraction methods, and population growth. In the case of fuelwood, respondents perceive the scarcity to be due to illegal logging, collection by local people, and the high demand for fuelwood from brick factories (Table 2). Finally, the respondents felt that sungrass was being depleted in response to the high demand for this resource, as well as the conversion of sungrass growing areas to paddy land, which is in even higher demand.

Table 2: Reasons given by community members for scarcity of major resources in CWS

Resources	Reasons for scarcity
Betel-leaf	• Between 1992 and 2002 betel-leaf was profitable as a result of affordability and availability of raw materials for production (e.g. bamboo, sungrass, pesticides, leaf shoots, labor) for fence construction, irrigation, fertilizer, etc. However, respondents suggest that these resources have become scarcer today and will continue to decline in the future. • The FD had a policy to destroy betel leaves. The Council has since changed this policy to limit the further expansion of betel leaf cultivation. • Rainfall scarcity in recent years
Bamboo	• Forest fire • Population growth and its associated demands • Increased need for income (resulting in exploitation of the resource for sale) • Unsustainable extraction levels (i.e., uncontrolled and repeated cutting)
Fuelwood	• Brickfields located around CWS require large amounts of fuelwood • FD restrictions on harvesting being motivated by Nishorgo staff members • Fuelwood collectors are now digging out the stumps and roots of trees • Illegal tree harvesting by the local community members and FD staff members
Sungrass	• Depletion of the forest resources and conversion of land to other uses • High demand by local poor

2) Do the forest actors enjoy a reasonable share of the economic benefits derived from forests?

This analysis helps to assess different stakeholders' perception of the distribution of forest benefits among the local population. In focus group discussions among the three stakeholder groups in each of the three villages, respondents were asked to use one hundred pebbles to show the percentage of total benefits they received from each of several major forest resources. They identified these major forest resources as paddy, betel-leaf, bamboo, sungrass and fuelwood. Paddy was considered a forest resource because it grows in forested areas (see Plates 1 and 2). The stakeholders who received benefits from these resources include the FD, betel-leaf cultivators, farmers, forest villagers, collectors, encroachers and businessmen.

Table 3 shows the median proportion (i.e. percentage) of benefits that the three stakeholder groups reported they received from each major resource. All three stakeholders ranked bamboo as the forest resource from which they received the most benefit (forest villagers had a median value of 16%, collectors and betel-leaf cultivators a median value of 15%). Collectors and betel-leaf cultivators received the second highest amount of benefit from paddy and sungrass, while forest villagers received their second highest amount of benefit from betel-leaf cultivation.

Table 3: Distribution of benefits from major resources in Chunati Wildlife Sanctuary among three major stakeholders

Respondent (key stakeholders)	Resources	Median % of benefits
Forest villagers	Paddy	12
	Betel-leaf	14
	Bamboo	16
	Sungrass	12
	Fuelwood	10
Collectors	Paddy	12
	Betel-leaf	10
	Bamboo	15
	Sungrass	12
	Fuelwood	8

Respondent (key stakeholders)	Resources	Median % of benefits
Betel-leaf cultivators	Paddy	12
	Betel-leaf	8
	Bamboo	15
	Sungrass	12
	Fuelwood	10

Appendix 1 shows how focus group respondents distributed perceived benefits from the forest among the three major stakeholders. Appendix 2 shows the distribution of these benefits across each of the three study sites. The values differ widely across beneficiaries, suggesting that not all forest stakeholders feel they receive an equal share – or even a reasonable share – of the economic benefits derived from forests. However, there is general agreement among focus group participants about the distribution of forest benefits among the various beneficiaries and sites.

Figure 3 illustrates the respondents' perceptions of the distribution of forest resource benefits among various stakeholders including the FD, businessmen, farmers, encroachers, betel leaf cultivators, collectors, and forest villagers. Focus group participants reported that farmers receive the greatest benefits from paddy (20%); that betel leaf cultivators benefit most from betel leaf cultivation (30%);

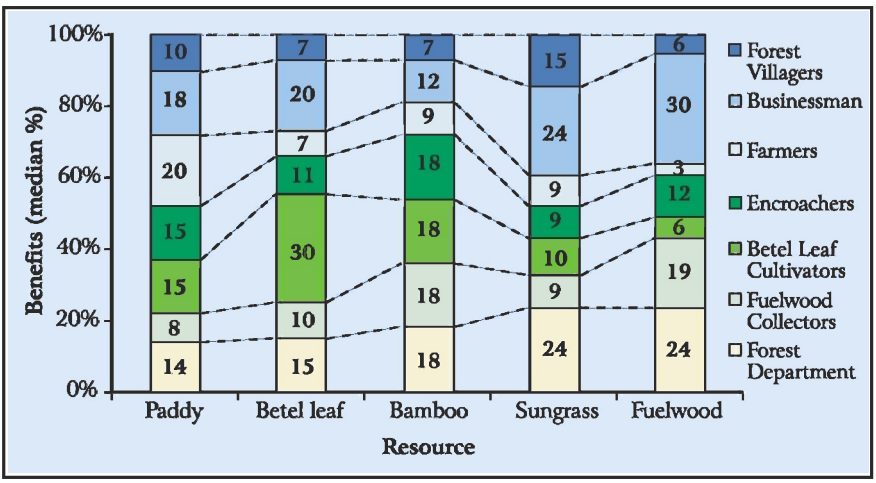

Figure 3: Perceived distribution of resources among various stakeholders at Chunati Wildlife Sanctuary

and that collectors benefit most from bamboo harvesting (18%). Businessmen are perceived as receiving a greater share than collectors for all resources except bamboo. Overall, businessmen and the FD receive 30-50% of the benefits from forest resources despite their higher economic status and less direct relationship to the forest compared with forest villagers, betel-leaf cultivators and collectors. This suggests an inverse relationship between forest benefits and dependency, and inequity in the distribution of benefits.

3) Are people linking their own and their children's future to the management of forest resources?

This section attempts to capture local actors' perceptions of changes in access to resources occurring over time. Using the PDM, we asked participants in focus group discussions to gauge how the ability to access forest resources has changed, or is changing, for their grandparents, themselves and their grandchildren. Table 4 shows the results of this analysis. It reveals that all major stakeholders perceive that their access to those forest resources upon which their livelihood depends (as mentioned in Figure 2) is better than it was for their grandparents. However, current collectors believe their grandchildren will have less access to forest resources; forest villagers think the grandchildren will have the same amount of access; and betel-leaf collectors think their grandchildren will have greater access. Group discussions suggest that grandparents had less need to use forest resources because they could meet their needs from their private lands and their population density was low, but their access to forest resources was also limited due to the stricter enforcement of the Forest Act by the FD. Today, however, people have fewer private resources, resulting in higher overall consumption of forest resources. In the future, however, forest villagers' fear that the government will become more strict and prohibit their use of these resources (as they believe the FD sees them as a burden on the forest); collectors think that the government might be more strict than at present in prohibiting their use of resources; and betel-leaf collectors feel confident that their level of access will continue to rise because they have witnessed a steady increase in betel-leaf farming over the last decade.

Table 4: Perceived generational differences in resource access among three main stakeholders at Chunati Wildlife Sanctuary (stakeholder's perceptions of their own group)

Stakeholders (respondents)	Generation	Access to resources (median % value)
Forest villagers	Grandparent	21
	Self	39
	Grandchildren	39
Betel-leaf cultivators	Grandparent	10
	Self	40
	Grandchildren	48
Collectors	Grandparent	32
	Self	35
	Grandchildren	30

Figure 4 presents a comparative picture of how all respondents perceive the distribution of resources among the three stakeholder groups (forest villagers, betel-leaf cultivators and collectors) and among the three generations (grandparents, self and grandchildren). Forest villagers feel that the ability of their grandchildren to access resources will be greatly diminished (28%) compared with their grandparents (43%) and themselves (34%), respectively. On the other hand, both collectors and betel-leaf cultivators predict that their grandchildren will have better access (36%) to forest resources compared with their grandparents (29% and 28%, respectively) and themselves (33% for both) (based on median percentages using the PDM).

Forest villagers feel that they have less access to forest resources than the other two stakeholder groups, and that their future access will be reduced due to increased irrigation costs, which were not as significant in the past because forest cover helped to conserve natural water supplies. Respondents also feel pressure not to expand their paddy fields, a primary source of livelihood for many. In general, the declaration of CWS has created a situation of conflict over traditional resource use that has been further aggravated by the attitudes of local FD officials. This conflict has led local people to believe that the declaration of the Sanctuary will impede their livelihoods. As a result, local people have become concerned with the loss of their traditional rights.

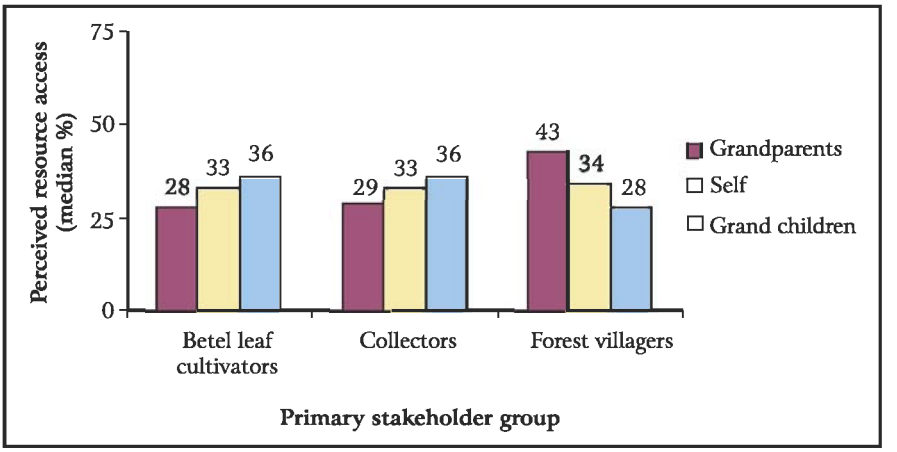

Figure 4: Perceived distribution of access to resources among all stakeholders by each of the three major forest beneficiaries in Chunati Wildlife Sanctuary.

Assessing stakeholders' acknowledged rights and means to manage forests

Our focus group discussions generated information about various rights and means of forest management. Figure 5 shows the distribution of scores for this category among all major stakeholder groups, as identified by the respondents during focus group discussions. This figure suggests that participants perceive that the rights and means to manage forests are highly skewed with the FD having the greatest rights, followed by NSP, the Council and the Committee, the patrolling groups, and the forest user groups. The group with the least perceived rights and means to manage forests were 'other stakeholders', or those local people who are not directly involved in NSP activities. More broadly, dividing the management groups

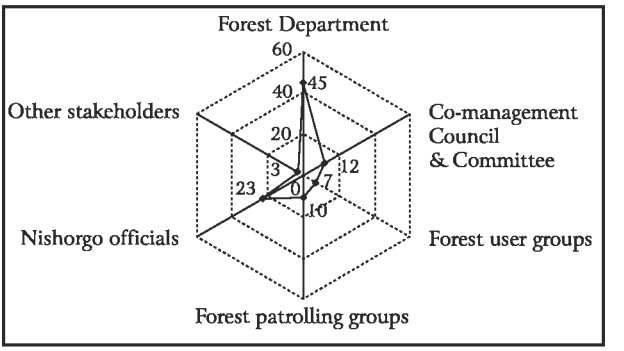

Figure 5: Perceived distribution of rights and means to manage resources in Chunati Wildlife Sanctuary among various stakeholders (mean % of all participants' responses)

into three major groups – the FD, NSP and the groups it has initiated (co-management institutions and user groups), and other stakeholders – shows that both the FD (45%) and Nishorgo (52%) are perceived to share roughly equal rights and means to manage resources in CWS (Figure 6).

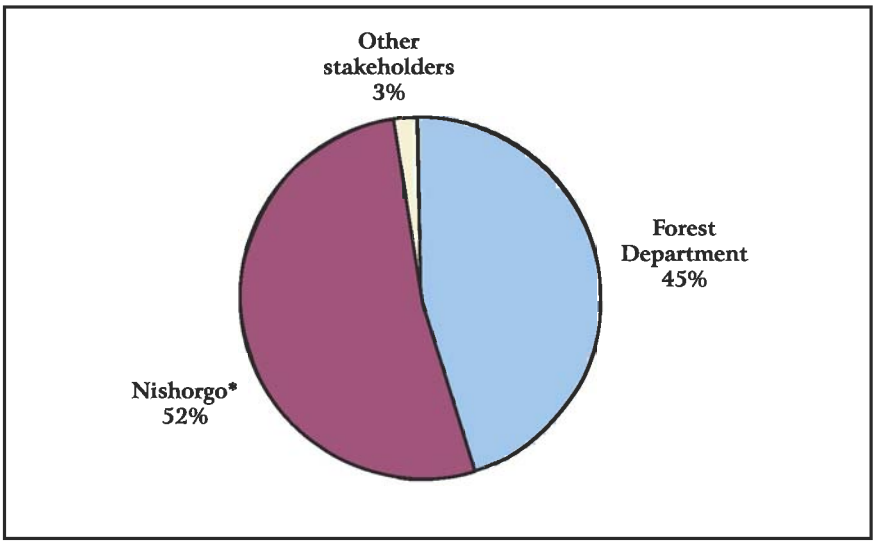

Figure 6: Perceived distribution of rights and means to manage resources in Chunati Wildlife Sanctuary (*grouping all Nishorgo-related stakeholders together)

Assessing the health of stakeholders, cultures and the forest

This section focuses on assessing the health of forest respondents, their culture, and their surrounding PAs. The three members of the team assessed these issues independently, through open-ended discussion and personal visits in different areas of the sanctuary (see Colfer *et al.* 1999a).

In focus group discussions, participants said that they perceived no "balance between human activities and environmental conditions." Participants acknowledged that activities such as illegal logging, fuelwood and bamboo collection, forest fires, removal of top soil for brick-making and cultivating paddy and betel-leaf on encroached land have all contributed to the degradation of the wildlife sanctuary. Participants also noted that certain NSP activities – such as providing alternate

livelihood support and motivating forest users through meetings, campaigns, group discussions, and development of social organizations – are improving environmental conditions in the sanctuary. Hence, to some extent they do recognize a balance between human uses and environmental conditions. However, they were also concerned that the activities promoted by Nishorgo would also restrict their ability to maintain their livelihoods. They further mentioned that immigrants from both nearby areas and distant locations (e.g. refugees from Myanmar) are placing additional pressure on the sanctuary and exacerbating the current imbalance between the environment and human activities.

Participants are aware that forestry work is potentially hazardous to their physical well-being, and they feel that the FD does not ensure workers' safety. Wild elephants in the sanctuary pose another threat to the health of inhabitants. Some participants have suggested that NSP should provide indirect health benefits to local inhabitants by improving recreational and health care facilities, and by promoting a cleaner environment through restricting brick-making factories and introducing improved cooking stoves (thereby decreasing exposure to smoke and other environmental hazards). Participants further expressed that neither the FD nor Nishorgo have formal mechanisms for addressing health-related issues.

Historically, strong connections have existed between forests and human cultures. These relationships are often reflected in the status of forests and the communities that live in or near them. Participants feel that neither the FD nor Nishorgo have promoted a link between these two issues. Forest management plans do not typically consider human culture, since they do not include indicators of cultural disintegration.

Overall assessment of human well-being in Chunati Wildlife Sanctuary

Human well-being consists of three broad issues or principles: access to resources; rights and means to manage forests; and health of humans, their culture and the forests they rely upon (Colfer *et al.* 1999a). The three team members estimated human well-being in CWS individually, according to these criteria and related indicators. Figure 7 shows the summary of these calculations. A detailed list of selected criteria and indicators under each of the three principles, with values assigned by each of the three investigators, can be found in Appendices 3-5.

Figure 7 illustrates that rights and means to manage forests cooperatively and equitably (Principle 2) has a higher overall score than both intergenerational access to resources (Principle 1) and health of the human, culture and the forests (Principle 3). Furthermore, the results reveal that local stakeholders do acknowledge the importance of the relationship between forest maintenance and human culture (6.98); all three team members agreed that local stakeholders have knowledge of forest resources and forest management plans prior to implementation (6.57); and that effective mechanisms exist for two-way communication between forest management staff and the various stakeholders (6.16). However, the relationship between forest management and human health is poor (1.89); and to date co-management has not yet promoted adequate control of and access to resources (3.3). Respondents also perceive a strong link between the management of resources and their own/children's future. The government-approved Councils and Committees, with their defined roles and procedures for management activities, may outline the rights and responsibilities of different stakeholders. However, it is too early to have achieved the goal of equitable access for all stakeholders, as such institutions have yet to be fully assessed and operationalized.

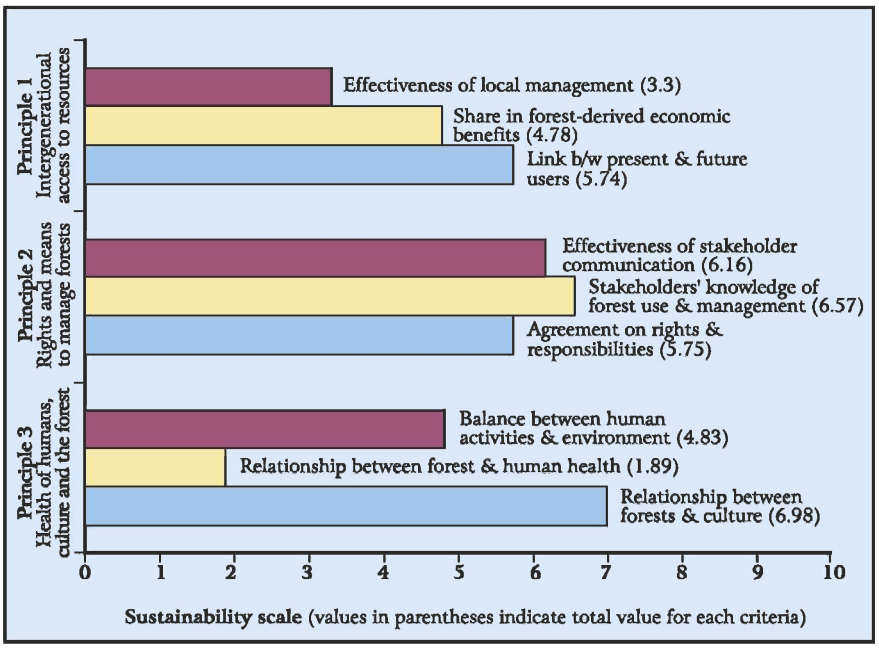

Figure 7: General picture of human well-being at CWS under the three broad principles

Figure 8 below summarizes the scores for the three main dimensions (principles) of human well-being for CWS (see Appendix 6 for a more detailed breakdown of this scoring). According to Colfer *et al.* (1999a), any value of 3 or below (on a scale of 1-10) means that the level of human well-being is unacceptable. Box 2 shows the final calculation of human-well being according to this methodology, revealing that human well-being in CWS is not acceptable at current levels (total score = 1.67).

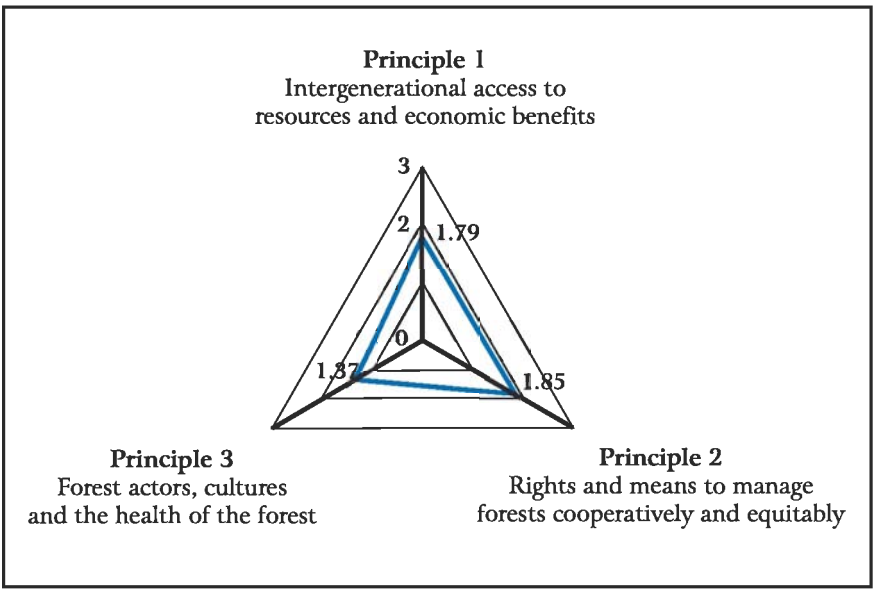

Figure 8: The overall status of human well-being in Chunati Wildlife Sanctuary

Box 2: Calculations of human well-being in Chunati Wildlife Sanctuary

Human well-being in Chunati Wildlife Sanctuary

= [P1 (Score) × W1] + [P2 (Score) × W2] + [P3 (Score) × W3]
= [1.79 x 40%] × [1.85 × 30%] + [1.37 × 30%]
= 0.71 + 0.55 + 0.41 = 1.67

Note: P1/P2/P3 = Principles 1/2/3; W1/W2/W3 = Weighting for Principles 1/2/3

(According to methodology of Colfer et al. 1999a)

Discussion and conclusions

This study utilized a methodology developed by CIFOR to assess the well-being of three groups of stakeholders participating in co-management activities of NSP in CWS. We assessed three main areas of well-being: intergenerational access to resources; means and rights to manage resources; and the health of forests, forest actors and their cultures. Results suggest that human well-being in CWS is already unacceptably low and decreasing.

In terms of intergenerational access to resources, results reveal that local stakeholders believe forest resources will decrease in CWS in the future (Figure 2). Among these resources, they feel that fuelwood will have the highest scarcity, which might boost the rate of extraction of alternative fuels such as bamboo, thereby affecting elephant habitat. Nishorgo is trying to alleviate the fuelwood crisis by introducing alternative energy-saving strategies, such as an improved stove technology that will help minimize the use of fuelwood, but these activities are still in their pilot phase. We conclude that access rights to forest resources in CWS are ill-defined, poorly monitored, and inadequately enforced. The lack of clear definition of these rights results in conflict, as people perceive that resources are not distributed fairly, and that their present and future access to these resources is not secure.

On a more positive note, I observed that NSP activities have resulted in increased employment and associated training opportunities for local people; that local people feel that damages to their crops and property are compensated in a fair manner; that wages and benefits received from forest activities are fair and reasonable; and that mechanisms exist for sharing benefits among local communities and community members. Forest villagers, however, believe that the FD and businessmen receive the largest share of benefits from the forests, particularly compared to those stakeholders who depend on these resources for their livelihoods, including themselves. This is a 'red flag' suggesting a lack of equity in access to benefits. Thus, NSP and the FD should focus on ensuring equitable access to benefits among all stakeholders. Furthermore, illegal activities must be met with strong action to effectively enforce forest policy. Finally, marketing channels should also be developed to facilitate the development and sale of alternative forest products.

Inter-generational access to resources is the most important aspect of human well-being assessment, because this dimension affects the long-term availability of forest resources for those who depend on them most, thereby influencing their propensity to take care of the forest (Colfer *et al.* 1999a). Our study reveals that different stakeholders have different perceptions about how resources are distributed among generations. Betel-leaf cultivators and collectors feel that access to forest resources will improve in the future, while forest villagers think that access will be reduced. In Cameroon, Brocklesby *et al.* (1997) and Tiani *et al.* (1997) reported an inverted U-shaped distribution – reduced access for grandparents and grandchildren in comparison to the current generation – which we also found for collectors in CWS. In most cases, inequitable access to resources occurs only when traditional resource management institutions, either formal or informal, break down (Binwager 1989; Jaganathan 1989; Duraiappah 1998). This generally happens when these institutions become inefficient and/or ineffective. We hypothesize that the massive resource harvesting that occurred in CWS immediately after it was declared a wildlife sanctuary generated insecurity of traditional resource rights (especially among forest-dependent people) and produced conflicting ideas about PAs that were further aggravated by the actions and attitudes of FD officials. The result was a rapid loss of resources from the area due to illegal harvesting, as the focus group discussion revealed. At the same time, a communication gap formed between local people and the FD, ultimately leading to the obstruction of traditional resource uses. NSP was initiated, in part, to reduce this fissure.

NSP's strategies for improving forest management include motivating people to conserve resources; involving local stakeholders and FD personnel in resources management; and providing support for alternative livelihoods. All of these are worthy measures for ensuring the well-being of local people, but questions remains about how well the project is being managed and implemented. Local people claim that the current distribution process of alternative livelihood support is unfair. Moreover, NSP's lack of capacity to handle multiple stakeholders – combined with their prolonged decision-making process, slow implementation, and frequently changing policy decisions – has created a state of uncertainty and insecurity about access to resources, both now and in the future. However, on a more promising note, local people are aware of the link between resource exploitation and destruction and value the importance of protecting these resources for their own and their

children's sustainable future use. Hence, the current generation places some value on protecting forest resources for their descendants, even if they are primarily concerned with their own immediate future.

In terms of rights and means to manage resources, the FD has historically assumed sole responsibility for managing CWS and has denied local stakeholders their rights. This has created an unsustainable situation. Local stakeholders have knowledge that can strengthen the legitimacy of their claims to land and forests (Kaskija 2002). Thus, there should be some legally binding mechanism that supports their rights to management, extraction, ownership and monitoring in the PA (Tacconi *et al.* 2004). Our study reveals that local stakeholders perceive that approximately 55% of the resource management rights and responsibilities in CWS are now assigned to stakeholders other than the FD (Figure 5). This perceived change in who holds the rights and means to manage the sanctuary may provide an opportunity for drawing on valuable local experience (Colfer *et al.* 1999a). The major achievement NSP has made is to have brought FD personnel and local stakeholders to the same table for discussion. This provides local stakeholders with a voice in decisions about management prescriptions and implementation plans.

Nishorgo's efforts to give local stakeholders greater rights and capacity for accessing and managing resources will almost certainly have a positive impact on the future well-being of all stakeholders. Studies conducted in Indonesia, Cameroon, and Brazil by Tchingkawa *et al.* (2001), following the same "Basic Assessment Guide for Human Well-Being" approach employed here, conclude that greater management rights for local communities promote more sustainable forest management, which ultimately helps to ensure human well-being.

In terms of assessing the health of stakeholders, their culture and their forests, it has been suggested that large-scale ecological degradation heightens tensions, leads to conflict, and threatens human well-being by contributing to health problems (Homer-Dixon 1994). Our field experience revealed that ecological degradation is extensive and pervasive in CWS. NSP is trying to rectify this problem by teaching people about the importance of conservation, and by promoting alternative income-generating activities for forest-dependent communities. However, local stakeholders have also expressed concern about people immigrating into the vicinity of the sanctuary from neighboring areas, including (refugees) from

Myanmar. These migrants might have negative impacts on the health of stakeholders, their culture and their forests. However, it is promising that local stakeholder groups do not appear to have serious conflicts within or among themselves, although it would require a longer-term study to provide more insight on this issue.

Safety and health are key concerns of management activities at CWS where the existence of wild elephants provides an immediate threat. Results show that respondents spent the majority of their day engaged in activities within the PAs including farming and collecting fuelwood, sungrass, bamboo, and betel-leaf (Plate 3). However, we found no provisions for ensuring the health and safety of local people or tourists entering into the area. Moreover, the FD does not have any safety rules, laws, policies, or guidelines on health and safety issues for workers engaged in various forestry activities, although local people have developed some innovative techniques to safeguard themselves from wildlife, especially elephants. It is important to develop such guidelines, and to conduct awareness raising activities to ensure health and safety in PA management.

The preceding analysis, using criteria and indicators adapted from Colfer *et al.* (1999a) with some modifications, shows a clear picture of the overall level of human well-being in the Sanctuary (Figure 7). These results suggest that NSP has improved the condition of local stakeholders by enhancing their rights and means to manage forests. In terms of the health of local people, their culture and their forests, however, serious concerns remain. The population is increasing and resource harvesting continues unabated, thereby creating a threat to conservation and long-term human well-being in the Sanctuary (see Plates 1-4). The study reveals that conservation goals cannot be achieved without active involvement of local inhabitants, and that NSP's conservation efforts at CWS will only succeed if local people benefit. Therefore, concrete guidelines and institutions should be developed to ensure adequate and equitable local benefits and to promote human well-being in CWS in the long-term. In this regard, Nishorgo's initiatives to establish and support Councils and Committees can play a critical role.

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Plate 1: Landscape view of Chunati Wildlife Sanctuary - A compromised scenario

Photo: Abu Rushed Jamil Mahmood

Plate 2: Competing land-use pressure with agriculture - Paddy as major resource in Chunati Wildlife Sanctuary

Photo: Abu Rushed Jamil Mahmood

Plate 3: Traditional betel-leaf cultivation – A major source of livelihood from Chunati Wildlife Sanctuary

Photo: Abu Rushed Jamil Mahmood

Plate 4: Harvesting sungrass and bamboo from Chunati Wildlife Sanctuary – A daily activity for sustaining the livelihoods of resource dependent people

Photo: Abu Rushed Jamil Mahmood

Appendix 1: Perceived distribution of forest benefits among various beneficiaries by the three principal stakeholder groups at Chunati Wildlife Sanctuary

Major resources	Beneficiaries	Location (research sites)*		
		Aziznagar	Harbang	Jaldi
Paddy	Forest department	12.6	12.0	13.0
	Fuelwood collectors	7.3	10.3	8.0
	Betel-leaf cultivators	13.6	6.6	8.6
	Encroachers	12.0	11.0	11.0
	Farmers	24.6	24.3	22.6
	Businessmen	20.3	22.0	25.6
	Forest villagers	9.3	13.6	11.0
Betel leaf cultivators	Forest department	23.3	25.0	22.0
	Fuelwood collectors	6.3	6.3	5.3
	Betel-leaf cultivators	25.3	23.3	26.3
	Encroachers	6.3	5.3	4.0
	Farmers	7.6	5.6	4.6
	Businessmen	19.0	24.0	29.3
	Forest villagers	12.0	10.3	8.3

Major resources	Beneficiaries	Location (research sites)*		
		Aziznagar	Harbang	Jaldi
Bamboo	Forest department	19.6	18.0	18.3
	Fuelwood collectors	19.3	20.6	21.0
	Betel leaf cultivators	20.3	16.6	20.6
	Encroachers	12.0	13.3	9.6
	Farmers	7.3	6.0	6.0
	Businessmen	12.0	18.3	18.3
	Forest villagers	9.0	7.0	6.0
Sungrass	Forest department	15.6	11.0	11.6
	Fuelwood collectors	9.3	11.3	11.0
	Betel-leaf cultivators	18.0	16.6	18.6
	Encroachers	10.6	10.6	8.3
	Farmers	10.0	9.6	8.0
	Businessmen	24.6	30.6	30.3
	Forest villagers	11.6	10.0	10.6
Fuelwood	Forest department	28.0	22.3	25.3
	Fuelwood collectors	19.0	22.6	21.0
	Betel-leaf cultivators	5.0	5.0	5.0
	Encroachers	10.0	8.6	11.0
	Farmers	5.6	5.0	5.3
	Businessmen	26.6	31.6	27.6
	Forest villagers	5.6	4.6	4.6

*Note: Figures represent average perceived percentage among respondents from each stakeholder group

Appendix 2: Comparison of perceived distribution of forest benefits at the three research sites of Chunati Wildlife Sanctuary (percentages)

Major resources	Beneficiaries	Location (research sites)*			Average (all sites)
		Aziznagar	Harbang	Jaldi	
Paddy	Forest department	14.0	13.3	10.3	12.5
	Fuelwood collectors	7.6	8.3	9.6	8.5
	Betel leaf cultivators	9.6	13.0	6.3	9.6
	Encroachers	11.6	10.3	12.0	11.3
	Farmers	21.0	24.3	26.3	23.8
	Businessmen	23.3	20.6	24.0	22.6
	Forest villagers	12.6	10.0	11.3	11.3
Betel leaf cultivators	Forest department	23.3	29.0	18.0	23.4
	Fuelwood collectors	7.0	4.6	6.3	6.0
	Betel leaf cultivators	25.0	23.3	26.6	25.0
	Encroachers	7.6	3.0	5.0	5.2
	Farmers	6.0	5.6	6.3	6.0
	Businessmen	21.6	22.3	28.3	24.1
	Forest villagers	9.3	12.0	9.3	10.2
Bamboo	Forest department	19.3	20.6	16.0	18.6
	Fuelwood collectors	20.0	21.6	19.3	20.3
	Betel leaf cultivators	14.3	20.6	23.0	19.3
	Encroachers	16.0	8.6	10.3	11.6
	Farmers	8.6	6.3	4.3	6.4
	Businessmen	15.0	12.3	21.3	16.2
	Forest villagers	6.6	9.6	5.6	7.3
Sungrass	Forest department	17.0	9.6	11.6	12.7
	Fuelwood collectors	9.3	12.0	10.3	10.5
	Betel leaf cultivators	14.0	15.6	23.6	17.7
	Encroachers	9.3	9.0	11.3	9.8
	Farmers	6.6	13.3	7.6	9.2
	Businessmen	29.3	31.0	25.3	28.5
	Forest villagers	13.0	9.3	10.0	10.7

Major resources	Beneficiaries	Location (research sites)*			Average (all sites)
		Aziznagar	Harbang	Jaldi	
Bamboo	Forest department	25.3	24.3	26.0	25.2
	Fuelwood collectors	20.3	24.3	18.0	20.8
	Betel-leaf cultivators	5.3	4.3	5.3	5.0
	Encroachers	9.6	8.6	11.3	9.8
	Farmers	4.6	4.3	7.0	5.3
	Businessmen	30.0	29.3	26.6	28.6
	Forest villagers	4.6	5.6	5.6	5.0

*Note: Figures represent average perceived percentage among respondents at each site.

Appendix 5:

Scoring of criteria and indicators on Principle 3 - Stakeholders' Acceptance about their Health, Cultures, and the Forests at three sites in Chunati Wildlife Sanctuary (by each investigator and collectively)

Cases/Evidence	Harbang				Aziznagar				Jaldi				CWS Average
	Investigator No.			Site Avg.	Investigator No.			Site Avg.	Investigator No.			Site Avg.	
	1	2	3		1	2	3		1	2	3		
C 3.1 There is recognizable balance between human activities and environmental conditions													**[4.83]**
(I) 3.1.1 Environmental conditions affected by human uses are stable or improving	4.50	5.29	5.30	5.03	4.85	5.00	5.50	5.12	6.00	5.75	5.00	5.58	5.24
(I) 3.1.2 In-migration and/or natural population increases are in harmony with maintaining the forests	3.75	4.33	4.30	4.13	4.00	4.67	4.10	4.26	5.13	4.80	4.70	4.88	4.42
C 3.2 The relationship between forest management and human health is recognized													**[1.89]**
(I) 3.2.1 Forest managers cooperate with public authorities regarding illness related to forest management	1.00	2.39	2.30	1.90	1.35	2.40	2.10	1.95	1.50	2.00	2.50	2.00	1.95
(I) 3.2.2 Nutritional status is adequate among local populations	1.00	1.78	2.80	1.86	2.00	2.00	3.10	2.37	2.50	2.79	3.60	2.96	2.40
(I) 3.2.3 Forest employers follow general or specified work or safety conditions and take responsibility for forest related health risks of workers	1.00	1.50	1.30	1.27	1.00	1.50	1.60	1.37	1.00	1.50	1.60	1.37	1.33
C 3.3 The relationship between forest maintenance and human culture is acknowledged as important													**[6.98]**
(I) 3.3.1 Forest managers can explain links between relevant human cultures and the local forests	7.25	5.34	6.00	6.20	7.25	6.38	6.30	6.64	7.50	6.25	6.10	6.62	6.50
(I) 3.3.2 Forest management plans reflect care in handling human cultural issues	5.37	6.98	5.60	5.98	5.50	6.50	5.80	5.93	5.50	6.60	6.30	6.13	6.02
(I) 3.3.3 There is no significant increase in signs of cultural disintegration	8.00	8.29	9.10	8.46	8.00	8.30	9.60	8.63	8.00	8.20	8.50	8.23	8.44

Appendix 6:

Calculation of score of three principles under the assessment of human well-being in Chunati Wildlife Sanctuary

Principle / criteria	Average score*	Weighting factor (%)	Average value (avg. score x weighting factor)	Total score for principle
P1 Forest management maintains or enhances fair intergenerational access to resources and economic benefits				
C 1.1 local management is effective in controlling maintenance of, and access to, the resource	3.30	15	0.495	**1.79**
C 1.2 Forest actors have a reasonable share in the economic benefits derived from forest use	4.78	15	0.717	
C 1.3 People link their children's future with management of forest resources	5.74	10	0.574	
P2 Concerned stakeholders have acknowledged rights and means to manage forests cooperatively and equitably				
C2.1 Effective mechanism exists for two-way communication related to forest management among stakeholders	6.16	10	0.616	**1.85**
C 2.2 Local stakeholders have detailed, reciprocal knowledge pertaining to forest resource use as well as forest management plans prior to implementation	6.57	10	0.657	
C 2.3 Agreement exists on rights and responsibilities of relevant stakeholders	5.75	10	0.575	
P3 The health of forest actors, cultures and the forest is acceptable to all concerned stakeholders				
C 3.1 There is recognizable balance between human activities and environmental conditions	4.83	10	0.483	**1.37**
C 3.2 The relationship between forest management and human health is recognized	1.89	10	0.189	
C 3.3 The relationship between forest maintenance and human culture is acknowledged as important	6.98	10	0.698	

*Note: Average scores are from calculations in Appendices 3-5.

Bangladesh has one of the highest population densities and one of the lowest levels of protected area coverage in the world. As a result, sustainable natural resource management and biodiversity conservation are critical issues. To address these issues, the Nishorgo Support Project was launched in 2003 as an undertaking of the Forest Department of Bangladesh, with financial and technical support from USAID. The overall goal of the Nishorgo Support Project is to enhance biodiversity conservation in targeted protected areas through the active and formal involvement of local communities dependent on forest resources.

This book is the second of two volumes investigating recent and ongoing initiatives for the co-management of natural resources being implemented by the Nishorgo Support Project. The first volume (Fox *et al.* 2007) investigated issues of rural livelihoods near protected areas selected as pilot co-management sites by the Nishorgo Support Project. The second (current) illustrates that the co-management of natural resources and protected areas occurs on multiple levels. The authors show that although community-based natural resource management is still in its infancy in Bangladesh, measurable improvement has been made in terms of poverty reduction, gender equity, resource dependence, and income-earning opportunities. However, co-management is not only about allowing local citizens to participate in forest management activities and share in the benefits that these activities produce; local users and stakeholders must also have the ability to influence the decisions that affect their livelihoods and their access to resources. It is in this area of participation that many issues remain to be addressed. Lack of local stakeholder input afflicts not only the governance machinery in place for co-management (i.e., the structure of the councils, committees, and forest user groups), but also the biological and social monitoring process, and the means by which PA benefits are distributed and selected.

The two volumes were produced under a joint applied research project of the Nishorgo Support Project and the East-West Center (Honolulu, Hawaii). Through this project a series of workshops were arranged in 2006 and 2007 to engage Bangladeshi researchers in developing research proposals and conducting field studies in any of the pilot protected areas, and to write up their results. The overall objective of this research initiative was to encourage the Forest Department and local academic institutions to conduct applied research in order to support the design of new and more appropriate management plans and policies for protected areas in Bangladesh. The applied research process was led by Dr. Jefferson Fox of the East-West Center (Honolulu, Hawaii) in collaboration with the Nishorgo Program of the Bangladesh Forest Department. This research effort was financed by the Government of Bangladesh and USAID. The Nishorgo Support Project receives technical assistance from IRG of Washington DC/USA and its partner NGOs, CODEC, RDRS, NACOM and IUCN/Bangladesh.

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