



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

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## ***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

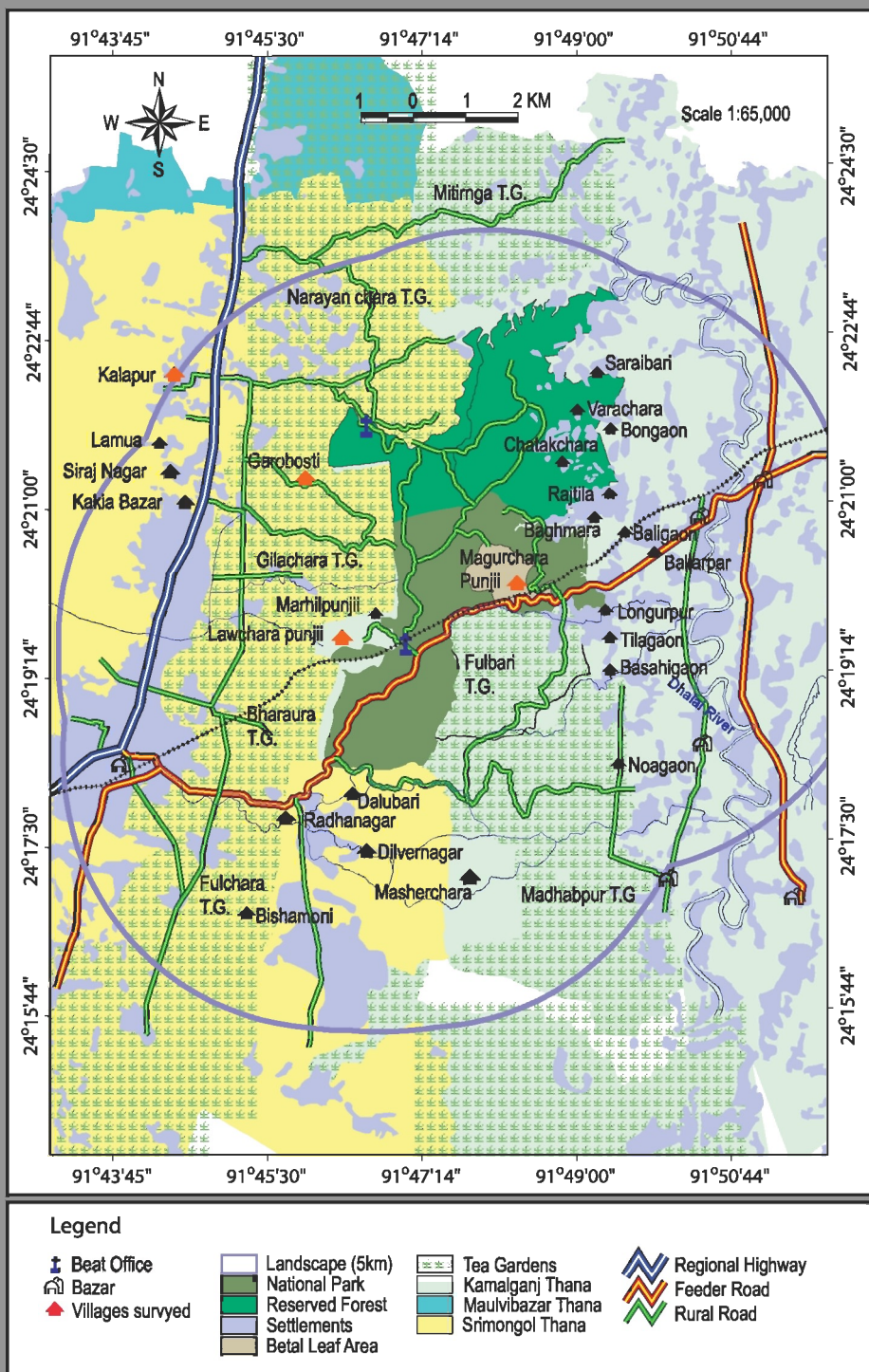


Figure 1: Lawachara National Park with the two study villages indicated



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 implement 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 knowledge 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: ----- Ajar, moyai 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

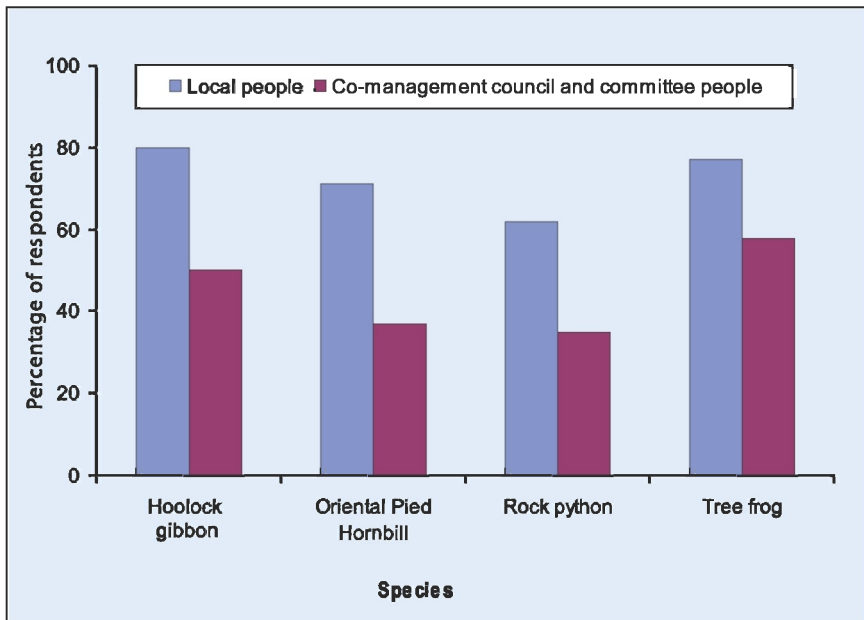
NOTE: Photos of these four key wildlife species were printed on identification cards for use in interviews.

## 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.”

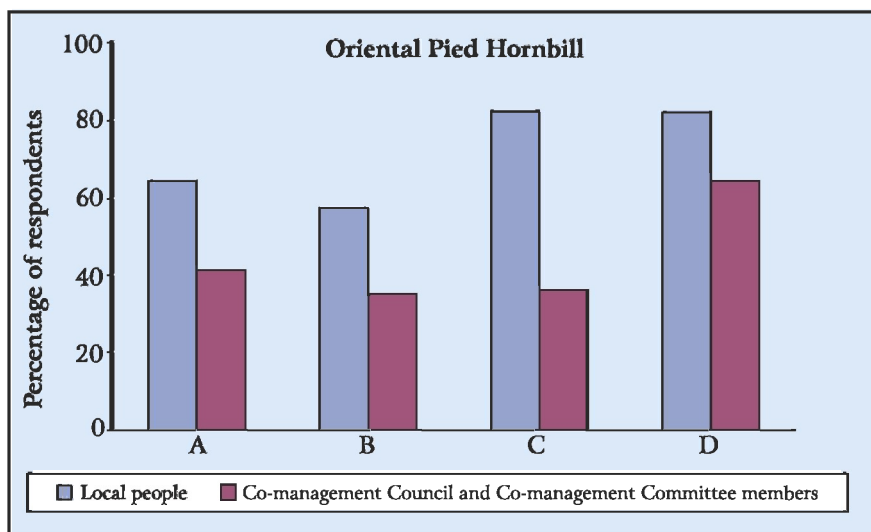
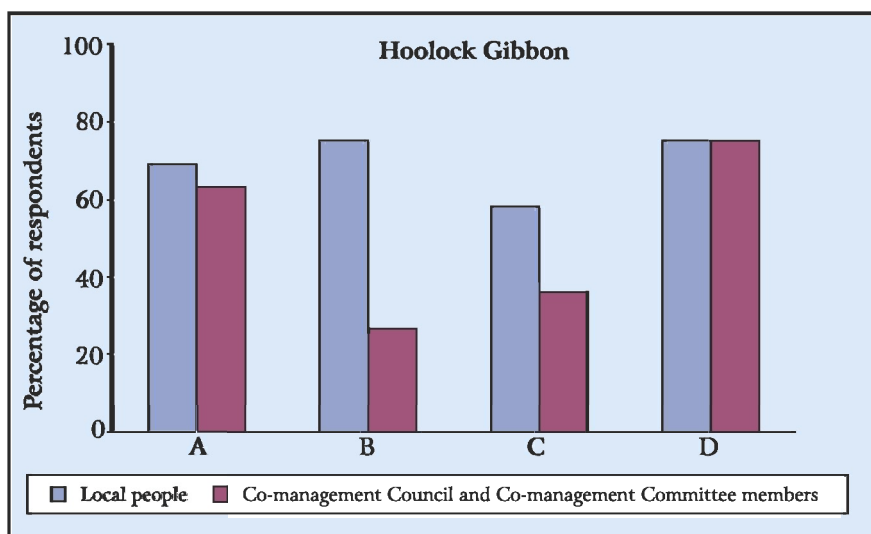
**Table 4: Positive responses to questions on selected wildlife species-Local people (LP) versus Co-Management Council/Committee Members (CMM) of LNP**

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.



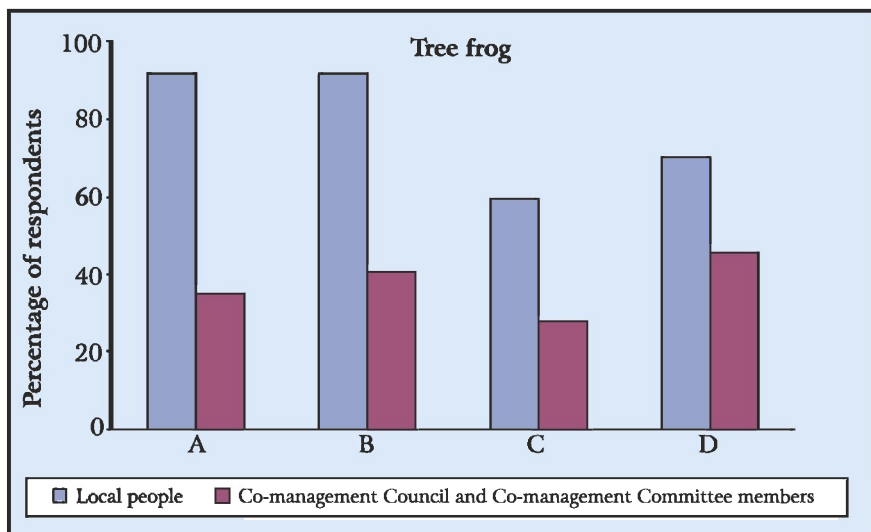
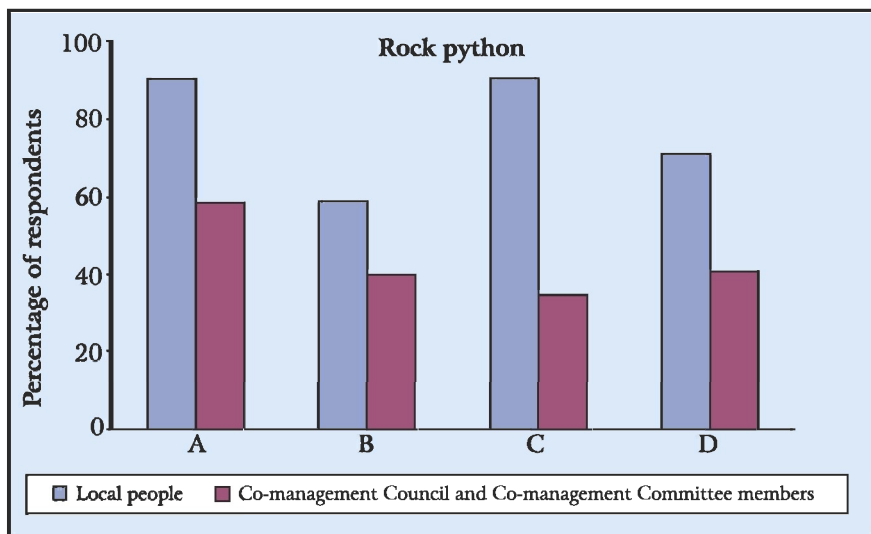
Figures 3-6: Perceptions of wildlife species by local people versus Co-management Council and Co-management Committee members



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	<i>ulluk, bhulluck, ban manush, banar</i>	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	<i>dhanesh, dhanesh pakhi</i>	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	<i>ajagar, gachh shap, mayal shap</i>	Seen long ago in <i>pahar</i> (small earth mounds), now in zoo and on television	In jungle, <i>pahar</i> , tea gardens	Can bite and/or engulf goats or cattle	No respondents have positive perceptions of this species
Tree frog	<i>gach bang, banar bang, gechu bang, pahari bang</i>	In bushes, trees, and sometimes in house yards	Visible in <i>pahar</i> 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	<i>Hoolock hoolock</i>	+++	+
Mukhpura hanuman	<i>Tracypithecus pileatus</i>	+++	+
Banar	<i>Macaca mulatta</i>	+++	++
Lajuk banar	<i>Nycticebus coucang</i>	++	+
Shuar	<i>Sus scrofa</i>	+++	++
Chitra horin	<i>Cervus axis</i>	+	-
Sambar	<i>Cervus unicolor</i>	+	-
Maya horin	<i>Muntiacus muntjak</i>	++	+
Bon chagal	<i>Capricornis sumatraensis</i>	+	-
Pipilikabhuk	<i>Manis crassicaudata</i>	+	+
Uranta kathbirali	<i>Petaurista magnificus</i>	++	+
Shojaru	<i>Atherurus macrourus</i>	++	+
Khargosh	<i>Lepus nigricollis</i>	++	+
Ram kutta	<i>Cuon alpinus</i>	+	-
Ban biral	<i>Felis chaus</i>	++	+
Sonali biral	<i>Catopuma temmincki</i>	+	-
Gecho bagh	<i>Neofelis nebulosa</i>	++	+
Chitta bagh	<i>Panthera pardus</i>	+	-
Mecho biral	<i>Prionailurus viverrinus</i>	++	+
Kalo bhalluk	<i>Ursus thibetanus</i>	++	+
Bagdhash	<i>Viverra zibetha</i>	++	-
Myna	<i>Gracula religiosa</i>	+++	+
Dhanesh	<i>Anthraceroceros albirostris</i>	+++	+
Raj dhanesh	<i>Buceros bicornis</i>	++	-
Bhimraj	<i>Dicrurus paradiseus</i>	+++	+
Choto bhimraj	<i>Dicrurus remier</i>	+++	+
Sabuj Ghughu	<i>Chalcophaps indica</i>	+++	+
Shama	<i>Copsychus malabaricus</i>	+++	+
Bon morog	<i>Gallus gallus</i>	+++	++



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

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