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REVIEW OF ISSUES AND OPTIONS FOR THE SUSTAINABLE FINANCING OF PROTECTED AREAS MANAGEMENT IN BANGLADESH

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REVIEW OF ISSUES AND OPTIONS FOR THE SUSTAINABLE FINANCING OF PROTECTED AREAS MANAGEMENT IN BANGLADESH

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INTRODUCTION

1.1 PROTECTED AREAS IN BANGLADESH

Bangladesh has established 22 protected areas, covering slightly more than 240, 000 hectares. This represents approximately 0.5% of the surface area of Bangladesh. More than half of the protected areas are designated as wildlife sanctuaries (7), national parks (9), or game reserves (1) and account for more than 99% of the area in protected areas (see Table 1.1).

Table 1.1: The Protected Areas of Bangladesh

Name of the Protected Area	Declared Status	Area in ha	Year of Notification (Year of establishment in parenthesis)
Sundarbans East	Wildlife Sanctuary	31227	1996
Sundarbans South	Wildlife Sanctuary	36970	1996
Sundarbans West	Wildlife Sanctuary	71502	1996
Chunati	Wildlife Sanctuary	7761	1986
Pablakhali	Wildlife Sanctuary	42087	1983
Rema-Kalenga	Wildlife Sanctuary	1795	1981
Char Kukri Mukri	Wildlife Sanctuary	40	1981
Bhawal	National Park	5022	1982
Madhupur	National Park	8436	1982
Himchari	National Park	1729	1980
Ramsagar	National Park	28	2001
Nijhum Dweep	National Park	16352	2001
Kaptai	National Park	5464	1999
Lawachara	National Park	1250	1996
Medhakachchapia	National Park	396	2004
Satchari (proposed)	National Park	240	proposed
Teknaf	Game Reserve	11615	1983
Dulhazara	Safari Park	600	(1999)
Bashkali	Eco-Park	n/a-	(2003)
Madhupkunda	Eco-Park	125	(2001)
Sitakunda	Botanical Garden & Eco-Park	1000	(2000)
Mirpur	Botanical Garden	84	(1961)

The remaining five protected areas are small in size and designed to meet the growing demand for "nature recreation." Included in this group are a safari park, three eco-parks, and two botanical gardens (one of which is co-located with an eco-park). The newer parks have been created on Reserve Forest land.

At a level of 0.5 percent of the country's surface area, the PA network in Bangladesh is the smallest in Asia, in both percent of surface area and area per capita.[1] Neighboring Sri Lanka has over 10 percent of its surface area in protection, while India has an estimated 5.1 percent of total surface area in protection. International guidelines call for 5 percent of a country's surface area to be allocated to protected areas, so Bangladesh is at one-tenth of the international standard.

1.2 MANAGEMENT AND FINANCING CHALLENGES

The limited supply of protected areas is compounded by weak management and a lack sustainable financing to cover recurring management costs and support improvements in the natural resources and physical infrastructure in protected areas. Management weaknesses are quite visible in the protected areas – trees are being illegally harvested for logs and fuel wood. While the illegal harvesting problem is ubiquitous, the impacts on protected areas are most notable in the south. A decade ago, Chunati Wildlife Sanctuary contained patches of Garjan and other forest species but today is virtually treeless and Teknaf Game Reserve is also in a rapid state of depletion. Remote areas of Lawachara National Park have been cleared of trees and fuel wood harvesting is proceeding at a rapid rate throughout the park.

The illegal harvesting activities are quite difficult to curtail, given the limited human resources and equipment at the disposal of protected area managers, the dispersed nature of the activity, and the socio-economic dimensions. The pressure on fuel wood resources comes mainly from poor communities surrounding the protected area that have limited options for securing and/or paying for fuel wood needed for cooking purposes. Poor communities may also supplement their incomes through fuel wood sales. While communities near protected areas may also be involved in logging activities as laborers, recent evidence from the Forest Department suggests that illegal logging is organized and financed by local elites in concert with regional or national power groups.

If the forests in PAs are cut down, some of the country's most important wildlife will disappear. Only 131 Hoolock Gibbon survive today and most of these are found in Protected Areas like Lawachara National Park. The few remaining Asian Elephants live in Chunati Wildlife Sanctuary and Teknaf Game Reserve, but they are threatened there. The Capped Langur, of which only 187 survive, may soon be gone and any loss of the Sunderbans forest will threaten the Bengal Tiger.

In addition to the demands placed on protected areas for woody biomass, the borders of all the existing PAs are under constant pressure through small (and large) claims to land authorities that individuals had previous rights to these lands, or that education institutions have interest in them. These land conversion pressures have been particularly visible at Bhawal National Park, but they exist to a greater or lesser degree at all the PAs of the country.

The challenges of improving management and increasing and sustaining financing for the protected areas are intertwined – apart from financial support for the Forest Department from the central budget, many of the PA financing options depend on the quality of the protected areas and the services provided in the PA. Unless the level of illegal harvesting can be brought into check, it will be difficult to exploit new financing opportunities.

[1] Data from the EarthTrends Database at http:// www.earthtrends.wri.org, jointly funded by UNEP, UNDP, WRI and other donors. Figure includes data from IUCN Protected Area Categories I-V.

1.3 THE NISHORGO PROGRAM AND THE NISHORGO SUPPORT PROJECT

The Nishorgo Program was conceived as a strategic response to the management crisis described above. The Program is the Protected Area Management Program of the Forest Department in the Ministry of Environment and Forest. The Program aims to ensure protection and improved management of these places of natural beauty before they are forever gone. The Nishorgo Program supports six complementary components:

Co-management and Partnership: The Program recognizes that the Government cannot ensure protection of nature without the collaboration of local and national stakeholders. To this end, the Program is establishing co-management agreements by which participants support conservation. Newly constituted Co-management Councils and Committees at pilot Protected Areas set new standards for transparency and openness, and allow a local voice in Area management.

Alternative Income Generation: The Program is working to identify and introduce viable alternative options for local stakeholders that may have relied on forests. One important option is community-friendly eco-tourism. Others include tree nurseries, handicraft enterprise development, alternative energy use, livestock fattening, rice processing, and other agricultural activities.

Policy Change and New Constituencies for Protected Areas: The Program is working to improve policies for Protected Areas. The Wildlife Act, 1974, is being revised. A vision statement entitled Nishorgo Vision 2010 sets out ambitious goals and a new orientation for Protected Area management. The Program also works to build constituencies to support Protected Areas conservation.

Institutional Capacity Development: The Program supports a variety of training and capacity building efforts focused principally on the local stakeholders and the Forest Department staff and systems itself.

Infrastructure and Visitor Services: The Program has already developed hiking trails and accompanying brochures for five initial Protected Areas. Future improvements will include improved signs, visitors' centers, staff quarters, access and parking facilities.

Ecosystem Regeneration and Rehabilitation: Bangladesh is blessed with very fast growing forests. In most cases, if the logging and fuel wood collection can be stopped, the forests will return naturally. But where natural regeneration needs an extra push, the Program will work to rehabilitate sites through selected planting.

The Forest Department has set out its vision for change in *Nishorgo Vision 2010*. Expected changes include these leading institutional improvements:

- The Protected Areas will become an integrated, recognizable and accessible System
- Protected Area managers will be partners in local and regional development
- At each Protected Area, visitors will be able to receive an orientation about what can be observed or learned from there
- Visitor facilities will be made available at each Protected Area.
- These improvements, and others, will lead to changes in the quality of our Protected Areas:
- In targeted Protected Areas, illegal felling will cease
- Biodiversity will increase, as evident in indicator bird species
- Forests loss will reverse, and forests will begin to regenerate.

In support of the Forest Department's Nishorgo Program, USAID is providing assistance through the Nishorgo Support Project (NSP). The Project provides targeted support for development of the co-management model at five initial pilot Protected Areas, including Lawachara National Park, Rema Kalenga Wildlife Sanctuary, Satchuri National Park, Teknaf Game Reserve and Chunati Wildlife Sanctuary. The NSP is implemented by International Resources Group, Ltd. of Washington, DC with Bangladeshi partners CODEC, NACOM and RDRS. The Project began in 2003 and will end in May of 2008.

1.4 GOALS OF THE REPORT

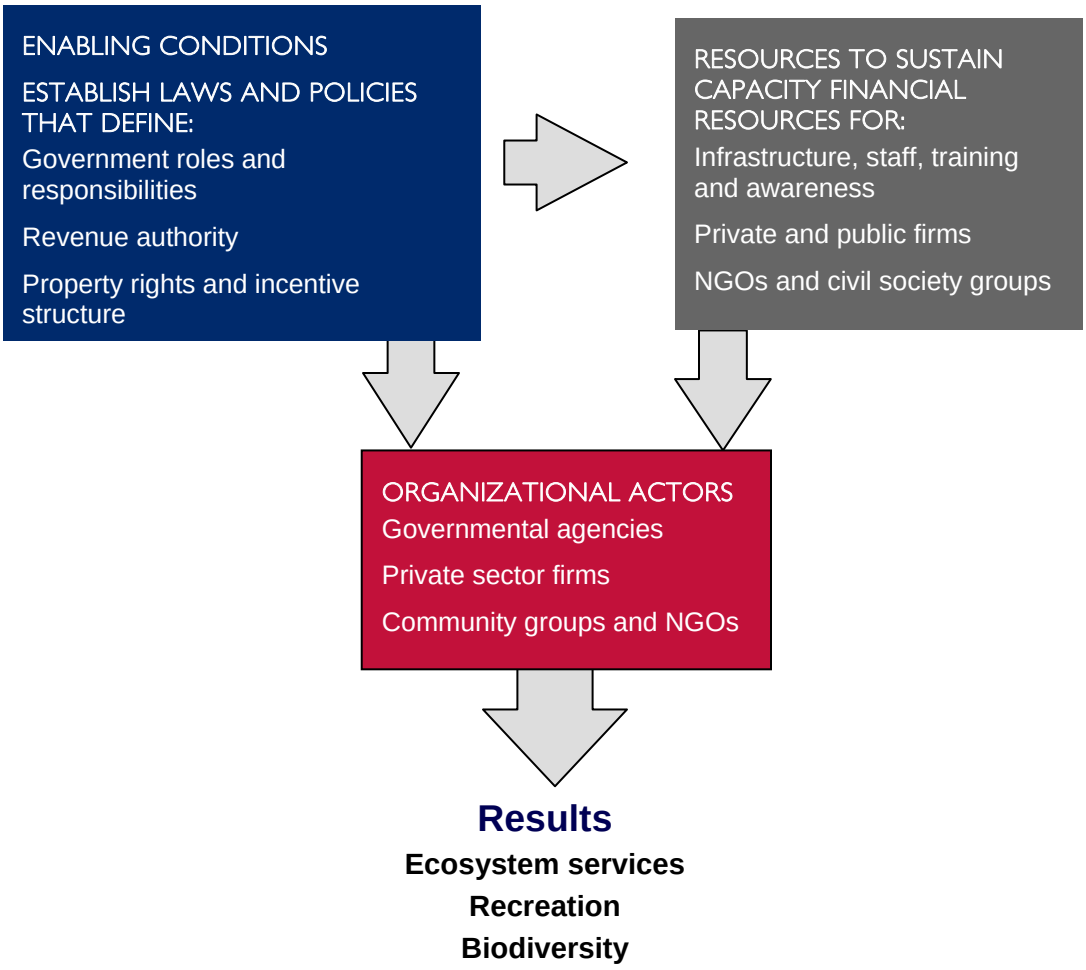
Establishing an effective protected area management system requires attention to three interrelated elements: 1) developing and implementing appropriate enabling conditions (laws, policies, and strategies); 2) mobilizing financial resources to sustain the organizations that share the challenge of managing protected areas; and 3) strengthening the capacity of the relevant organizational actors. Figure 1.1 illustrates the linkages between these three elements.

The major goal of this report is to provide recommendations for increasing the level of financing to support protected area management in Bangladesh on a sustainable basis. In addition, the report will also examine the role that protected areas can play in reducing poverty in the many communities located in and adjacent to protected areas. To explore this second topic, the discussion focuses on the economic challenges of the 18 communities in proximity to Lawachara National Park.

1.5 OUTLINE OF THE REPORT

The remaining sections of the report are organized into four chapters. **Chapter 2** provides an overview of protected areas values. One of the major hurdles in securing adequate financing support for protected areas is overcoming the narrow view on the values inherent in or produced by protected areas. Chapter 2 examines protected area values in a broad perspective, consistent with international conventional wisdom. **Chapter 3** provides a survey of financing mechanisms that have been used to support protected area management efforts. This chapter draws from experience in Asia, Latin America, and Eastern Europe. **Chapter 4** assesses the problem of protected area financing in Bangladesh and provides recommendations for a protected area financing strategy. Finally, **Chapter 5** presents a case study on the role of protected areas in alleviating poverty and features Lawachara National Park and its surrounding communities.

Figure 1.1: Framework for improving protected area management



CHAPTER 2
VALUE OF PROTECTED AREAS

As noted in Chapter 1, Bangladesh has the smallest percentage of land area devoted to protected areas among Asia countries. Furthermore, those areas that have been designated as protected areas have not been effectively managed, certainly in comparison to other property managed by the Forest Department. One of the explanations for the low priority placed on protected area designation and management relates to the value that policymakers place on protected areas. If natural forested areas are mainly valued for the timber and non-timber products that can be harvested on them, policymakers will view designation in terms of harvesting revenues foregone rather than benefits that can be generated as a protected area. Similarly, if protected areas must compete with plantation forests for investment resources and staff and operating budgets, it will be difficult to make the case for protected areas unless there is greater understanding and appreciation for the values associated with protected areas. This chapter provides an overview of the values generated by protected areas. The first section provides an overview of the range of goods and services provided by protected areas. Section 2.2 presents a framework for valuing protected areas and briefly introduces issues to be considered in conducting valuation assessments and using valuation results. The final section provides a discussion of the range of values produced by protected areas, drawing on information on protected areas in Bangladesh and from other countries.

2.1 PROTECTED AREA GOODS AND SERVICES

The recently completed Millennium Ecosystem Assessment (WRI, 2005) provides a useful taxonomy of ecosystem services that can be adapted to the examination of protected area goods and services. Ecosystem services are divided into four categories:

- Provisioning services (food, fresh water, wood and fiber, and fuel);
- Regulating services (climate regulation, flood regulation, disease regulation, and water purification);
- Cultural services (aesthetics, spiritual, educational, and recreational); and
- Supporting services (nutrient cycling, soil formation, carbon sequestration and primary production).

While the Millennium Ecosystem Assessment refers to all of these ecosystem functions as "services," in economic terms, they represent both goods and services that can be produced by protected areas. Protected areas exhibit characteristics often attributed to both ***private*** goods and services and ***public*** goods and services. A private good or service is one that is rival in consumption. Rivalry means that once the private good is consumed by one individual, it is not available to others to consume. Examples of private goods produced by protected areas are timber, fuelwood, and non-timber products such as mushrooms, berries, or betel leaf. The key attribute of a public good is non-rivalry in consumption. This means that once the good or service is provided, it can be provided to any number of consumers without diminishing the amount of the public good that is available.[2] Examples of public goods include a scenic view, a highway, or information.

[2] Another consumption characteristic often associated with public goods is excludability. Early in the development of public good definitions, non-rivalry and non-excludability were both included in the definition of public goods. However, excludability is a technical issue – people can be excluded from consuming a public good – for example, the number of people at a scenic view can be rationed, access to information can be limited, and tollgates can control the flow of cars on a highway.

Protected areas provide a number of services that have public good characteristics, such as recreation, aesthetics, water purification and erosion control. Thus, in examining the value of a protected area, it is necessary to consider a range of goods and services displaying both private and public good characteristics.

2.2 A FRAMEWORK FOR VALUING PROTECTED AREAS

A useful framework for valuing protected areas is to consider the total economic value (TEV) of the protected area. TEV is the sum of all marketed and non-marketed benefits associated with the protected area including direct and indirect use, option value and non-use value. The TEV framework was applied to wetlands by Barbier (1989) and can be expressed algebraically as follows:

TEV = UV + NUV

= DUV + IUV + OV + NUV

where:

UV = use value

NUV = non-use value

DUV = direct use value

IUV = indirect use value

OV = option value

NUV is comprised of two components – existence and bequest value. Figure 2.1 summarizes the components of total economic value and Table 2.1 provides definitions and protected area examples of the component values of TEV.

Figure 2.1: Total Economic Value

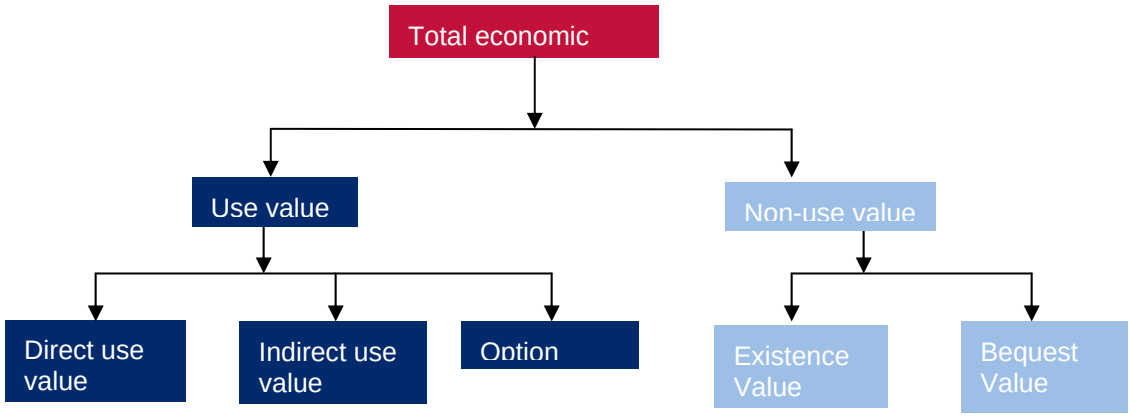


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Table 2.1: Use and Non-use Values

Use values	Definition	Examples
Direct use value	Value derived from direct consumption of the good or service of the protected area	Timber, fuelwood, non-timber forest products, recreation, plants and animals, research, education
Indirect use value	Value derived from a protected area service that contributes to the production of a good or service outside of the protected area	Water regulation and purification, carbon sequestration, risk/disaster mitigation, habitat, erosion protection
Option Value	Value placed on the protected area to ensure that it is available for future uses, some of which may not be currently known	Flora and fauna that may be valuable for medicines or cosmetics, option to visit protected area in the future
Non-use values	**Definition**	**Examples**
Existence value	Existence value relates to the belief that resources should exist even if they have no known use or future use value	Religious or spiritual value, aesthetic value, cultural value, biodiversity
Bequest value	Value stems from desire to give future generations the flexibility of determining how the protected area should be used	Similar to option value except that value not in terms of importance to individual but to recipients of the bequest.

In applying the TEV framework to protected area valuation, there are a few issues to be considered:

Values vs. Prices – Although it may seem obvious, value does not equate to revenues or market receipts. Many of the goods and services associated with protected areas are not priced or exchanged in market transactions. Value reflects a willingness to pay but does not require that payment is actually made. For example, it may be difficult to determine the value each consumer places on a protected area good or service or collect an amount equal to that value. For a public good like recreation, a price may be charged in order to generate revenues to cover the costs of supplying the public good, but this may be a much lower price than visitors are willing to pay.[3]

Whose values count? – The issue of who benefits from or values the protected area can be an important factor in managing protected area resources. Local communities may depend on protected areas for goods and employment opportunities while some of the services of protected areas may be valued by populations in the region or even globally (e.g., endangered species, carbon sequestration). TEV is an anthropocentric measure of value focusing on human-held values rather than intrinsic values of trees, soil, and biodiversity.

Trade-offs in values – Protected areas have both public and private good characteristics that are not necessarily complementary. In some cases, the management of protected areas for some characteristics can reduce the value of others. Thus, total economic value depends on how the resources are managed – if the focus is on harvesting of timber and fuelwood, other values may be adversely affected and reduced in value such as recreation, erosion control, habitat, and risk mitigation. At the other extreme, if protected areas are managed only for ecological services, direct use values may be diminished.

Valuation methods – Total economic value can be estimated, but such a calculation will often entail a variety of market and non-market valuation methods. Table 2.2 provides a glossary of valuation methods used in estimating TEV for protected areas.

[3] Entry fees for marine parks are often less than $20 for foreign visitors even though they may spend many times that amount for travel lodging and dive boat services.

Table 2.2: Glossary of Valuation Methods

Valuation Method	Description
Choice Experiment	A stated preference approach technique for valuing ecosystems or environmental resources that presents a series of alternative resource or ecosystem use options, each of which is defined by various attributes including price, and uses the choices of respondents as an indication of the value of ecosystem attributes
Conjoint analysis	A stated preference approach technique that asks individuals to consider the status quo and alternative states of the world. It describes a specific hypothetical scenario and various environmental goods and services between which respondents have to make a choice
Contingent valuation	A stated preference approach technique that elicits expressions of value from respondents for specified increase or decreases in the quantity or quality of an environmental good or service, under the hypothetical situation that it would be available for purchase or sale.
Cost based approaches	A group of techniques for valuation that look at the market trade-offs or costs avoided of maintaining ecosystems for their goods and services, including replacement costs, mitigation or averting expenditures and damage costs avoided methods.
Damage cost avoided	A cost based approach that estimates the value of ecosystem goods and services by calculating the damage that is avoided to downstream infrastructure, productivity or populations by the presence of ecosystem services
Effect on production	A production function approach that quantifies the relationship between changes in the quality or quantity of a particular ecosystem good or service with changes in market value of production
Market price	A technique for valuing ecosystems or environmental resources by using its market price: how much it costs to buy, or what it is worth to sell
Mitigation or averting expenditure	A cost based approach that assesses the value of ecosystem goods and services by calculating the cost to mitigate or avert economic losses resulting from their loss
Production function	A group of techniques that attempt to relate changes in the output of a marketed good or service to measurable change in the quality or quantity of ecosystem goods and services by establishing a biophysical or dose-response relationship between ecosystem quality, the provision of particular services, and related production
Replacement cost	A cost based approach that assesses ecosystem values by determining the cost of man-made products, infrastructure, or technologies that could replace ecosystem goods and services
Stated preference	A group of techniques that ask consumers to state their valuation of or preference for specific ecosystem goods and services directly including contingent valuation, conjoint analysis and choice experiment methods
Surrogate market	A group of techniques that look at the ways in which the value of ecosystem goods and services are reflected indirectly in people's expenditures, or in the prices of other market goods and services, including travel cost and hedonic price methods
Travel cost	A surrogate market approach that takes the costs that people pay to visit an ecosystem as an expression of its recreational value

Adapted from Glossary in IUCN (2004)

2.3 PROTECTED AREA VALUES IN BANGLADESH

In this section, protected area values are examined in some detail, drawing from international experience and the limited information available for Bangladesh. We first look at efforts to measure TEV and then selectively examine the various types of services provided by protected areas.

2.3.1 TOTAL ECONOMIC VALUE

The recent Millennium Ecosystem Assessment (MEA) included a number of efforts to estimate TEV for ecosystems and then compare TEV under alternative management regimes. In virtually all of these case studies, sustainable management of ecosystems in their most natural state resulted in TEV that exceeded the value for provisioning services such as timber harvesting and shrimp farming. One of the main reasons for this result is the adverse effect that some provisioning services have on the other benefits that can be provided by ecosystems. From the MEA, the following results were observed:

- In most countries, the marketed values of ecosystems associated with timber and fuelwood production are less than one-third of the total economic value. (WRI, p. 9, 2005)
- The net present value in dollars per hectare for a mangrove in Thailand is $1,000 per hectare for an intact mangrove compared to a value of $250 per hectare in shrimp farming. (WRI, p.10, 2005)
- In Cambodia, a tropical forest managed for traditional forest uses has a net present value of $1,300 per hectare compared to a net present value of $200 per hectare if managed for timber harvesting. (WRI, p.10, 2005)

To date, there has been one effort to estimate TEV for an ecosystem in Bangladesh. Under the USAID-funded Management of Aquatic Systems through Community Husbandry (MACH) project, Colavito et al. (2001) estimated the annual economic output of the Hail Haor wetland/floodplain in northeastern Bangladesh. They estimated ten categories of outputs including goods (fisheries and non-fisheries products and Boro rice) and services (recreation, flood control, and pasture) and obtained an annual economic value of $649 per hectare. Depending on the rate of discount used, this implies a net present value of several thousand dollars per hectare ($6,500 per hectare for a 10% discount rate). The results for this study are summarized in Table 2.3 on the next page.

2.3.2 PROVISIONING SERVICES

The principal types of provisioning services provided by protected areas are timber, fuelwood, and non-timber products. For wetlands and other aquatic ecosystems in protected areas, fisheries may also be an important source of value. For protected areas in Bangladesh, it is useful to examine provisioning services from two perspectives: 1) those provisioning services that are compatible with sustainable management practices in protected areas and 2) the potential value of illegal provisioning services.

In any protected area, some level of harvesting and gathering of dead trees and downed branches can be sustained. In addition, the gathering of non-timber forest products such as mushrooms, fruits, honey, grasses, bamboo, and nuts may be carried out on a sustained basis in protected areas. One of the challenges of protected area management is to determine what levels of provisioning services can be carried out without diminishing the other benefits provided by protected areas.

Table 2.3: Annual Economic Output of Hail Haor Wetland

Hail Haor Returns	Total Returns (Taka)	Current Returns (TK /HA)*	Percent
Commercial Fisheries	56,272,221	4,575	12.4%
Subsistence Fisheries	83,651,052	6,801	18.4%
Non fish products	126,056,499	10,248	27.7%
Recreation	7,025,634	571	1.5%
Flood Control	23,443,167	1,906	5.2%
Tea estate vegetation use	1,916,761	156	0.4%
Project / Biodiversity Funds	43,650,600	3,549	9.6%
Transportation	8,758,318	712	1.9%
Pasture value	40,292,840	3,276	8.9%
Boro rice value	63,857,500	5,192	14.0%
Water quality	Not Done	Not Done	
Aquifer charge	Not Done	Not Done	
Existence values	Not Done	Not Done	
Total (Tk)	454,924,591	36,986	
Total USD	$7,981,133	$649	

Colavito et al., 2001

It is also important to recognize the potential value of unsustainable and illegal harvesting of timber and fuelwood. As noted by Roy and DeCosse (2005) among others, protected areas in Bangladesh are under considerable threat due to illegal harvesting and fuelwood gathering and several national parks have been virtually denuded of large trees. While villagers near or in protected areas are responsible for much of the illegal fuelwood gathering that takes place, illegal logging appears to be organized and financed by local elites. Demand for timber from sawmills and furniture shops and for fuelwood by brick kilns (even though use of fuelwood is prohibited by law) and households for cooking purposes. As the Forest Department makes investments to restore forest cover in protected areas, the potential value of these illegal activities will need to be addressed in management plans and the design of co-management and/or compensation plans for villages in or adjacent to protected areas.

A third concern related to provisioning services are land conversion pressures at the fringe of protected areas exacerbated by the clearing of trees. Once the trees are cleared, encroachment and conversion to agriculture by landless poor can make it difficult to maintain the protected area as a contiguous ecosystem.

2.3.3 REGULATING SERVICES

At this point in time, many of the regulating services provided by protected areas in Bangladesh have not been recognized. Among the most important of these are flood control, water regulation and purification, erosion control, and risk mitigation. These regulating services provide benefits to residents in cities, water users and businesses in the form of reduced damages from floods and storms and reduced costs for the supply and purification of water. Although annual precipitation levels and fresh water availability appear more than adequate, the seasonal fluctuation in precipitation leads to periods of drought. Protected areas and particularly wetlands can play an important role in regulating water flows and increasing the water availability during periods of low precipitation. Mature forests and stabilize slopes reduce erosion and the transport of sediment in waterways.

The recent devastation associated with the tsunami in December 2004 highlighted the important role that coastal wetlands and particularly mangrove forests can play in mitigating risks. In the decades leading up to the tsunami, vast mangrove forests had been destroyed to facilitate shrimp farming and accommodate development. On the Indonesian island of Sumatra, 36 percent of mangroves had been lost. In Indonesia, Sri Lanka, Thailand, and India, damages from the tsunami were much less where intact coastal mangrove forests provided a buffer against storm surges. Such systems also help to prevent coastal erosion and protect coral reefs from siltation (Padma, 2004).

2.3.4 CULTURAL SERVICES

Cultural services associated with protected areas include recreation, education, and the promotion of spiritual or aesthetic values and cultural diversity. Until recently, most of these cultural services were not highly valued in Bangladesh. However, there is a nascent recreational market developing in Bangladesh, particularly for the botanical gardens and safari parks.

Except in protected areas which are charging an entrance fee, the actual number of visitors to protected areas in Bangladesh is unknown. There are important trends in recreation that suggest current and future demand for protected areas is significant:

As soon as a natural area is given even a minimum level of visitor services (parking, trails, animals to see, etc.), the number of visitors to those areas increases dramatically. Dulhazara Safari Park only completed its principal visitor infrastructure 18 months ago, and already it receives 18,000 visitors in a day on a busy weekend, and Dulhazara is not even within an hour of a major urban area.

Sitakunda Botanical Garden and Eco-Park can receive 50,000 paying visitors in a weekend.

Bhawal National Park receives over 100,000 visitors per year, and the Botanical Garden in Mirpur receives over half a million. And visitors to all these natural areas pay a fee for entry.

It is worth noting also that all of the visitors mentioned here pay an entry fee to access the sites at Dulhazara, Sitakunda, Bhawal and Mirpur (although no fee is currently required at other Parks, Sanctuaries and Game Reserves). Entrance fees are 5 Taka (~USD 0.10) at the Mirpur Botanical Garden in Dhaka and 10 Taka (~USD 0.20) at Dulhazara Safari Park and Sitakunda Botanical Garden.

While all these areas offer more recreational services than would be offered in Bangladesh's larger sized Protected Areas, the numbers are an indicator of a much larger interest in conservation services. A recent willingness-to-pay study conducted on the Bhawal National Park estimated that entry fees could be doubled at that Park with only marginal impact on the number of visitors, principally because the willingness-to-pay for a large proportion of the middle and lower income visitors was higher than the current 5 Taka entry fee.[4] Again, as for other areas pertaining to the economics of protected areas, the size and willingness to pay of the group we might call "PA visitors" is not yet accurately known.

In reviewing the trends in recreation demand, there are two important lessons to be drawn. First, once the infrastructure for the protected area is in place, demand increases quickly and dramatically. Dulhazar Safari Park started out with a 100 hectare area of forest for deer breeding in 2001 and later added other facilities including a nature interpretation center, orchid house, an elephants. The total area of the park has expanded to 600 hectares. Similar phenomena were observed at the Sitakunda Botanical Garden and Eco-Park. The basic infrastructure of the new Eco-Park was completed only two years ago, but the Park can accommodate as many as 25,000 visitors in a single weekend, which demonstrated an enormous demand for it.

[4] See "Socio-Economic Analysis of People's Willingness to Pay for Bhawal National Park", Salma Shahidul Islam, North South University BS Thesis in Economics. 2003.

The second lesson is that the demand for recreation in protected areas seems to be skewed toward those which feature a more active range of activities and services than are or might be provided in the larger, more remote protected areas in Bangladesh. However, the exposure of such large urban populations to the popular safari parks and botanical gardens can also serve to increase awareness of protected areas and engender a new pool of Bangladeshi citizens that branch out to recreation in the more sedate national parks. With increasing incomes and leisure time, urban populations will seek alternative destinations.

The other potential market for recreation is among foreign visitors and Bangladeshi diaspora. For these groups, which have unlimited choices in travel destinations, protected areas must feature natural, undisturbed forests, wetlands, and flora and fauna. In addition, to access the ecotourism market, supporting transportation infrastructure, lodging and other services need to be developed.

The other element of demand for protected area amenities and biodiversity is represented by regional and global donors and NGOs who may provide resources to help Bangladesh protect these resources. In recent years, Bangladesh has received assistance to protect these values from the Global Environmental Facility (GEF), ADB, the US government through the Tropical Forest Conservation Act and international NGOS such as WWF and IUCN. .

2.3.5 SUPPORTING SERVICES

One of the most important emerging and potentially valuable ecosystem services relates to carbon sequestration. Internationally, industries and energy companies are looking for opportunities to reduce greenhouse gases. Through flexible mechanisms such as carbon markets and the Clean Development Mechanism created by the Kyoto Protocol[5], industries facing high costs per ton of carbon reduced can enter into agreement to compensate landowners to grow trees and sequester carbon. Carbon sequestration represents a potential win-win outcome for protected areas, provided their managers can ensure against illegal harvesting. Carbon offsets can also provide investment capital for reforestation programs.

[5] Although the US is not a signatory of the Kyoto Protocol, the US is actively involved in nascent carbon trading and offset programs on a voluntary basis (and on a regulatory basis in some states such as Massachusetts and Oregon).

CHAPTER 3
SURVEY OF FINANCING MECHANISMS INTERNATIONAL EXPERIENCE

This chapter provides a survey of financing mechanisms, drawing on the rich international experience. While the primary emphasis is on those sources of financing that have been used specifically to finance protected area management, mechanisms used to finance other types of environmental activities are also considered as they could have applicability for protected area financing.

The survey is organized into three sections. The first section provides an overview of the various attributes of financing mechanisms that determine how they may be used and whether they are sustainable. The second and third sections focus on the two types of financing mechanisms: ***sources of financing*** and ***financial instruments***. A source of financing is a mechanism that generates funds that can then be: a) directly used for protected area expenditures; or b) to capitalize a financial instrument. Financial instruments are mechanisms that are directly involved in disbursing funds for expenditures on protected areas.

In this chapter, the sources of financing and financial instruments that are described include the following:

Sources of Financing	Financial Instruments
Donor, NGO, and foundation grants	Global Environment Facility
Multilateral bank lending operations	GCC mechanisms
Central budget resources	Environmental funds
Taxes, levies, and charges	Conservation trust funds
Debt-for-nature swaps	Payments for environmental services
Protected area user fees	

3.1 ATTRIBUTES OF FINANCING MECHANISMS

The sources of financing and financial instruments enumerated above and discussed in Section 3.2. and Section 3.3 differ in a number of significant ways that determine how they might be utilized as part of a PA financing strategy. Below, a number of the most important attributes are described in more detail.

Recipients – Funding generated or disbursed by these mechanisms often can only be provided to certain types of recipients; e.g., government agencies, NGOs, community groups, private firms, established environmental and conservation trust funds. Funding may also be tailored to specific protected areas or specific species such as endangered animals

Types of management activities supported – Some mechanisms are flexible in the range of management activities they can support; others are restrictive in their use, covering one or more of the following: habitat restoration and protection, improvements to the natural resources in the PA such as reforestation, recurring management costs (staffing and equipment), research, PA infrastructure, training, education and awareness programs, and support for co-management activities (undertaken by local NGOs or community groups)

Sustainability – financing mechanisms can be one-time sources (e.g., grants and loans), renewable sources requiring supporting documentation such as business or financial plans (e.g., central budget resources, or recurring sources such as taxes, user fees, or donations. For recurring sources, it may be necessary to make adjustments to meet revenue requirements (e.g., indexation of nominal tax or charge rates; fundraising campaigns to meet donation goals).

Relationship to specific PA characteristics or services – some mechanisms are tied to the resources or services of the protected area. These mechanisms include entrance fees, PA user fees (camping, lodging, hiking trail access), and concessionaire fees. GCC mechanisms may be tied to capacity of PA biomass to sequester carbon.

Non-revenue benefits generated by the source – some mechanisms such as taxes, fees, charges, and user fees may generate revenue and yield other side benefits. For example, pollution charges may generate revenue for environmental funds but also provide incentives for facilities to reduce pollution levels to reduce their pollution costs; and user fees may help to allocate PA resources to avoid congestion or maintain use levels below carrying capacity.

Special conditions and obligations attached to the mechanism – some examples of these conditions and obligations include status as a signatory to international or regional conventions or treaties such as the Convention on Biodiversity, co-financing or cost-sharing provisions, sovereign guarantee requirements, and repayment in the case of loans.

Table 3.1 describes sustainability issues and potential non-revenue benefits associated with the financing sources described in Section 3.2

Table 3.1: Characteristic of Financing Sources

Instrument	Sustainability Issues	Non-Revenue Benefits
Grants	Most often, one-time donor contribution	Depends on whether the grantor attaches special conditions to the use of the grant
Multilateral bank loans	Discrete transfer of funds for specific investment purposes	May be linked to improved management or financing practices; also depends on the type of co-financing used
Central budget resources	Requests must be made on annual basis and compete with competing priorities	No direct non-revenue benefits unless derived from earmarked sources
Pollution fees and fines	Increase per unit rates and/or expand collection base to maintain revenues as pollution per facility declines	If rates are high enough, may create incentives to reduce pollution or non-compliance violations
Natural resource taxes	Renewable vs. stock resources; indexing of nominal tax rates	May encourage improved efficiency, substitution of less expensive alternatives, recycling
Product charges	Charge rate must be sensitive to changes in demand , GDP growth, and technological change	If rates are high enough, may induce use of substitutes that create less pollution or waste
Debt reduction	One-time restructuring of commercial or official debt	Often includes special requirements related to protected area management
Entrance and special use fees	May need to be adjusted if set in nominal terms to account for inflation and changes in demand	May play role in limiting visitation to ecological carrying capacity levels or to avoid congestion
Donations	Public awareness campaign; maintenance of collection sites, favorable tax treatment for large donations	Creates fewer distortions in markets, mechanisms for soliciting donations can increase public awareness

Source: Anderson (2000), p.3

3.2 SOURCES OF FINANCING

3.2.1 DONOR, NGO, AND FOUNDATION GRANTS

Grants represent an attractive source of financing for protected area management because repayment is not required of the recipient. Grants may be provided by multilateral and bilateral donors, international NGOs, or foundations with an international portfolio.

Multilateral and bilateral donor grants are typically earmarked for specific projects and programs, relying on contractors (private firms and NGOs) in the donor country (or region as in the case of the European Union) to provide technical assistance activities and manage a limited amount of procurement to support recipient country agencies and protected areas. In some cases, donor grants have been used for the capitalization of environmental funds or conservation trust funds. For example, the European Union provided matching grants for start-up financing of national environmental funds in the Baltic countries. Most donors emphasize support for economic development and poverty alleviation and often bundle support for protected area management with alternative income and other programs to support communities adjacent to protected areas.

International NGOs such as the World Wildlife Fund, Conservation International, and The Nature Conservancy have played an important role in financing protected areas and biodiversity conservation in developed and developing countries. These NGOs often form partnerships with NGOs in recipient countries in carrying out PA and biodiversity programs. These NGOs strive to leverage their resources with contributions from other international sources, recipient governments and NGOs. Financing for protected areas may include support for research and studies, public awareness and training, habitat protection, institutional capacity building for PA management authorities, purchase of land to consolidate PA holdings, and support for management NGO endowments. International NGOs establish their own goals and objectives and will often require grant recipients to utilize these resources for activities that are consistent with these goals and objectives.

Foundations with international portfolios have become an important source of private sector financing in developing countries, typically providing support only to NGOs, community groups, and education and research institutions. There is a large concentration of private foundations in the United States that support international projects. In 2003, The Foundation Center identified more than 1,300 US-based private foundations awarding grants on the international level.[6] Foundations vary quite widely in terms of the size of grants, geographical area focus, range of topic areas supported, the uses of grants that are allowed (operating costs, capital endowment, project expenses, etc.), and in their project cycle details (application process, number of times each year grants are awarded.[7]

3.2.2 MULTILATERAL BANK LENDING OPERATIONS

Multilateral banks such as the World Bank (WB) and the Asian Development Bank (ADB) provide assistance to developing countries for a variety of purposes. With a primary mission of poverty alleviation, protected area finance provided by multilateral banks is most often packaged with other capacity building and investment activities. Where protected area finance is proposed for support, it is often necessary to demonstrate that biodiversity conservation and protected area management provide benefits to impoverished communities.

While some grant funding is available for institutional strengthening on a modest scale, the bulk of multilateral bank financing is in the form of loans to developing country governments.[8] In addition, the International Finance Corporation (IFC) provides loans for private enterprises. Multilateral bank loans can be utilized for a variety of activities that contribute directly or indirectly to protected area management:

Support for government agencies tasked with protected area management – resources can be used to support habitat restoration, investments in infrastructure, improved governance, training, and awareness programs.

Capitalization of targeted financial instruments – these include social development funds and micro-enterprise loan programs. In Slovenia, the World Bank provided "bridging loan support" to help capitalize the country's environmental fund. The favorable interest terms and grace period enable Slovenia to off-lend for environmental investments and repay the WB loan as beneficiaries repaid their loans to the environmental fund.

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[6] The Foundation Center, *Guide to Funding for International & Foreign Programs,* 2003. The Foundation Center also sells electronic versions of the Guide that provide opportunity to screen foundations according to geographical areas and topics supported.

[7] In 2004, IRG conducted a review of US foundations to identify the best prospects for supporting the management of Sierra Lacandon National Part in Guatemala. A matrix from this review is provided in Annex I to this report.

[8] The Inter-American Development Bank also provides direct financial support for NGOs

Multilateral bank financing involves well-defined project preparation and loan appraisal procedures and requires the support and commitment of the recipient government that may include sovereign guarantees. As a result, except under exceptional circumstances such as natural disasters, multilateral bank financing cannot be mobilized very quickly. However, in many countries, social development funds and micro-enterprise loan programs are already established and may be able to support alternative income generation activities in communities near protected areas.

3.2.3 CENTRAL BUDGET RESOURCES

Generally, central budget resources represent the primary source of financing for recurring costs of protected area management. In most cases, resource levels are determined in the annual budgeting process, where resources for protected areas compete with a variety of other public expenditure priorities, both within the sector (forests, fisheries, national parks, and other protected areas) and between sectors. As noted in the previous chapter, the value of protected areas are not widely recognized or appreciated by decision-makers. In many developing countries, national authorities have shifted all or a portion of the management responsibilities and costs to NGOs or local authorities, in part because it is difficult to rely on central budget resources for sustainable financing purposes. In some countries, the budgeting process involves fiscal rigidities that limit the annual level of increase in ministry/agency budgets, making it difficult to increase funding of protected areas from this source by more than a mandated percentage increase.

3.2.4 TAXES, LEVIES, AND CHARGES

To avoid the uncertainties in the central budgeting process, some countries have committed revenues from taxes, levies, and charges to protected area financing. For these types of revenue sources to be applicable for protected area financing, all or a portion of revenue collections must be ***earmarked*** for protected area finance. If these revenues are simply deposited in the central treasury, then they become part of central budget resources.

These revenue sources are not typically used to directly fund the management by government of protected areas but are used for some of the following funding purposes:

To capitalize environmental funds and conservation trust funds that are in turn used to support protected area activities and investments

To defray the costs of NGO co-management responsibilities (where management authority has been devolved – e.g., management of national parks in Guatemala by an NGO – Defensores de la Naturaleza; management of the John Crow and Blue Mountain National Park by the Jamaica Conservation and Development Trust)

To finance special development initiatives such as purchase of land for inclusion in protected areas

International examples of taxes, charges, and fees used in protected area finance include the following:

In Belize, a $3.75 departure tax traveling by cruise ship or air goes directly to Protected Area Conservation Trust ($750,000 per year) – there is also the normal departure tax of $11.25

In Seychelles, $40 departure tax (higher tax under discussion to preserve environment and improve tourism facilities

In the Cook Islands, $2 of $10 airport tax goes to Environmental Protection Fund

Six countries in Eastern Caribbean charge a $1.50 environmental levy on arriving tourists

In the US, 11% levy on sale of hunting weapons and ammunition and 5% levy on outdoor recreational equipment with proceeds used for wildlife restoration and funding of wildlife agencies

In Brazil, a licensing fee of at least 0.5% of total project cost is levied on large infrastructure projects and used to fund protected areas. Licensing fee may be greater than 0.5% depending on the degree of environmental impact caused by project

In East Kalimantan, Indonesia, a user charge was levied on water users to help finance protection measures in the Sungai Wain watershed

3.2.5 DEBT REDUCTION MECHANISMS

Debt reduction mechanisms have become a popular method for generating revenues for protected area and environmental financing. The key prerequisite is the existence of commercial or official debt in the developing country that the country would like to reduce or restructure because it is excessively burdensome or costly to service. Typically, debt reduction mechanisms involve one of two approaches: debt conversion and debt swaps (debt-for-nature and debt-for-environment).

Typically, debt servicing requires payment in hard currencies. Where local currencies are "soft" it can be very costly to service these debts in hard currencies. Thus, debt conversion schemes often involve forgiveness of debt payments in hard currencies, provided the debtor country allocates an equivalent amount of local currency to purposes mutually agreed by the debtor country and the country owed the debt. This debt conversion mechanism has been extremely popular. In Africa, Asia, and Latin America, $200 million in debt owed by the debtor countries has been converted into funding for forest preservation and protection of endangered wildlife. Two notable debt-for-environment swaps resulted in the creation and capitalization of ecofunds in Poland and Bulgaria. The Polish EcoFund over its envisioned finite life would receive $474 million in local currency. In Bulgaria, 20% of the country's official debt to Switzerland was converted to local currency to capitalize the National Trust EcoFund (OECD, 1999).

Debt-for-nature swaps usually occur when a country cannot finance repayment and the creditor starts to trade the debt at a lower price. This creates an opportunity for a third party such as a Fund or international NGO to purchase the debt from the creditor and then negotiate with the debtor country to swap the debt for special considerations such as the designation of protected areas. Since 1987, debt swaps have leveraged nearly one billion dollars worldwide for nature conservation (IUCN, 2000).

The US Tropical Forest Conservation Act (TFCA) is a US government program that involves three types of debt treatment: debt reduction, debt swap, and debt buyback. The debt program enables eligible countries to sign agreements with the US to generate funds that can be used for protected area establishment, restoration and protection, forest related training to uild scientific, technical, and managerial capacity, development and support of livelihoods for people living in or near forests, support for biodiversity and research. To date, almost $98 million has been generated by TFCA agreements in nine countries including Bangladesh. This amount includes co-financing from the World Wildlife Federation in the amount of $7.6 million in six Latin American countries (Lampman, 2005).

3.2.6 USER FEES

There are a variety of protected area user fees that have been used internationally to generate revenues for protected area management. The two most common types of user fees are entrance fees and special use fees. Tables 3.2 and 3.3 provide a survey of entrance and special use fees from around the world. Other types of user fees include bio-prospecting fees in which case companies pay for the right to search ecosystems for species of scientific and economic value; concessionaire fees paid for the privilege to provide accommodations, transportation, guiding services, food and merchandise sales.

Table 3.2: Protected Area Entrance Fees

Country	Description	Type of Protected Area	Comments
Costa Rica (1994)	$15 for foreign visitors	National parks	Fee raised from $1.50 to $15, foreign visitation declined by 44% but revenues increased substantially
Ecuador	Differentiated rates - $6 for Ecuadorians in all parks; foreign rates vary from $5 to $100 (Galapagos)	National parks	
Malaysia	$2.60	Sarawak Forest	Critics contend fees too high for national visitors
Mexico	$3 per visitor	National Marine Park	Fee is provided for in legislation but not collected
Nepal	$12 per visitor	Annapurna Conservation Area	Used directly for park maintenance
Philippines	$25 for local visitors; $50 for foreign visitors	Tubbataha Reef National Marine Park	
South Africa	$18 per visitor	Kruger National Park	
South Korea	$0.83 per visitor	National parks	Entrance fees plus user fees (e.g., camping) cover 32% of operating costs; WTP study for 5 parks suggest a fee of up to $14 could be charged
Thailand	$.50 to $1.00 per visitor	Recreational areas in Northern Thailand	
United States	Differentiated rates by popularity of park – up to $20 per vehicle for 7-day pass; $50 for annual vehicle pass	National parks	Demonstration project allows selected parks to increase entrance and user fees and retain 80% of additional revenue for park improvements
Zimbabwe (1996)	$.90 per day for residents; $5 per day for foreign visitors	Gonarezhou National Park	Higher rates of $1.80 and $10 were instituted but opposed and reduced to these levels after 2 months

Table 3.3: Protected Area Special Use Fees

Country	Description	Type of Use	Comments
Curacao	$10	Diving	Voluntary tag donation
India	$10 for adults; $5 for children	Elephant rides in Kaziranga National Park	Also fees for use of cameras and video cameras in park
Indonesia	$6 per day; $17 per year for foreigners	Use of facilities in Bunaken National park	
Malaysia	$1.30 camera permit; $2.60 fishing license; $1.30 car parking charge	Taman Negara National Park	
Mexico	$20 per site	Campsite fee in El Chico National Park	
Netherlands Antilles	$3 per dive in Saba; $10 per year for Bonaire Marine Park	Diving	In Saba, user fees account for 70% of operating costs; in Bonaire, user fees cover 80-90% of operating costs
Philippines	$0.85 per dive	Dives at coral reefs in Anilao	WWF WTP survey indicated a rate of $1.77 per day could be charged
St. Eustatius	$6 for day passes; $15 for annual passes	Diving fee for St. Eustatius Marine Park	
St. Lucia	$4 for day passes; $12 for annual passes	Diving fees	Also, vessel fees ranging from $10-$25 per day
United States	$4-15 per night	Camping fees at State parks	

Several trends in entrance fees and special use fees are worth noting:

- Fees are most often differentiated according to the visitor's origin – foreign visitors will typical pay twice (or more) as much as local visitors
- Even modest fees have met with local resistance while most fees are quite low for foreign visitors in relation to trip expenditures and income levels
- Virtually all willingness-to-pay surveys for entrance and special use fees have indicated that the fee amount could be increased substantially without reducing visitation
- Demand elasticity is a key factor in understanding how changes in fee rates will affect visitation, but more importantly revenues. Tourism officials often oppose user fees and other revenue mechanisms in cases where demand is elastic (indicating the availability of close substitutes). The more unique the protected area, the more inelastic demand. Thus, in Costa Rica, the large increase in entrance fees reduced visitation but still increased revenues.

3.2.7 DONATIONS

Donations are not a large source of financing for protected areas. However, the mechanism of soliciting donations has the added benefits of increasing awareness about the existence and financing challenges facing protected areas. Private donations are solicited in a variety of ways including bulk mailings, website requests, and donation boxes placed in visitor centers and other facilities, airport departure lounges, etc. Fundraising campaigns will often involve merchandise such as calendars, posters, etc. or create special categories for large donors such as "friends of the park." Corporate donations are usually managed differently as companies want to be recognized in special ways to enhance product sales or standing in the community. Often, corporate donations will take the form of a dedicated structure, visitor's center, etc. At Sitakunda Botanical Gardens and Eco-Park, Glaxo-Wellcome financed a large tent for provision of shade and the new Radisson Water Garden Hotel contributed to a protected area conservation campaign of the Forest Department. Another common strategy for corporate donations is the matching contribution mechanism where a company will match private donations according to a pre-agreed rate.

3.3 FINANCIAL INSTRUMENTS

3.3.1 GLOBAL ENVIRONMENTAL FACILITY

The Global Environmental Facility (GEF) was established in 1991 as an experimental facility and restructured after the Earth Summit in Rio de Janeiro in 1992 to provide grant financing for projects of global significance. The GEF supports projects in four areas:

- Biodiversity loss
- Climate change
- Degradation of international waters
- Ozone depletion

Since 1991, GEF has provided grants amounting to $4.5 billion to government agencies and NGOs and generated co-financing from other partners of $14.5 billion (Tarrant, 2005). GEF receives its financing from the contributions of the wealthier countries among its 166 member governments. In 1994 and 1998, the number of countries and the total amount of GEF financing were 34 countries ($2 billion) and 36 countries ($2.75 billion), respectively (IUCN, 2000).

Grant funding is available for both projects and to fund conservation trust funds, provided the country meets eligibility requirements (i.e., party to the Convention on Biodiversity and working with WB and/or UNDP through a Country Program). For projects, the GEF has strict *additionality* requirements that stipulate that GEF grants may only be used to fund the incremental costs of projects necessary to achieve global environmental benefits.

3.3.2 GCC MECHANISMS

A number of mechanisms are emerging to finance greenhouse reductions or compensate forest managers for sequestering carbon (see also Section 3.3.5 focused on payment for environmental services). Under the Kyoto Protocol, the Clean Development Mechanism (CDM) is one of three market mechanisms established that allows Annex I parties to meet greenhouse gas remission reduction targets through investments in developing countries. The CDM rules are continuing to evolve in specifying the types of projects that are acceptable in achieving Certified Emission Reductions.

In addition to the programs established under the Kyoto Protocol, there are new carbon trading and carbon offset programs that can be used to generate revenues for forestry and/or protected area investments and management practices. A list of new carbon markets and carbon offset programs is provided in the box on the next page developed by USAID/EGAT/ESP.

In general, the major role of the GCC mechanisms in protected area finance related to carbon sequestration in tree cultivation. As noted in Chapter 2, one of the key challenges in promoting carbon sequestration services is the prevention of illegal logging.

3.3.3 NATIONAL ENVIRONMENTAL FUNDS

Environmental funds are institutions designed to channel revenues for environmental purposes. More than 40 economies in transition and developing countries have one or more environmental funds, organized at the national, regional, or local levels. Some funds support broad-based environmental and natural resource projects while others are narrowly focused funds that finance operations of a single park or protected area. Some funds have been created as units of government while others are independent legal entities such as trusts or foundations.

Environmental funds play two important roles in environmental and natural resource policy. First, environmental funds are a tool of environmental policy, providing financial resources for environmental and natural resource purposes. Second, environmental funds are institutions that can make a strategic contribution to environmental and natural resources policy.

Environmental funds, through their financial support, may address funding shortfalls in government conservation programs and provide a source of funding for organizations such as conservation and environmental NGOs with limited fundraising capabilities to cover operations and project costs.

Opportunities for obtaining payment for carbon offsets/credits

Many U.S. and international companies are voluntarily purchasing carbon offsets to mitigate their companies' climate impact. Below are some resources that can help you understand this growing voluntary carbon market. If you are interested in your mission/partners getting involved in carbon offsets, please contact the Global Climate Change team at USAID/W for technical assistance (see http://inside.usaid.gov/EGAT/off-esp/techareas/climate_change/overview/index.html).

Natsource Greenhouse Gas Credit Aggregation Pool is a for-profit energy commodity trading firm. Its Web site provides concise information on the types of emissions traded, the outlook for emissions trading in the United States, and a glossary of terms related to emissions trading.http://www.natsource.com/

Trexler and Associates is a for-profit organization that locates carbon offsets for private companies and NGOs

http://www.climateservices.com/

Chicago Climate Exchange (CCX) is among the first U.S.-based voluntary pilot programs for trading greenhouse gases. The project's goal is to include national and international sources.

http://www.chicagoclimatex.com/

Oregon's **Climate Trust** selects and funds reduction projects for private companies such as Nike and Delta Airline:

http://www.climatetrust.org/

CO2e.com (Cantor Fitzgerald & PriceWaterhouseCooper) is a multinational company created to serve as the pre-eminent business-to-business resourced for companies to understand, mitigate and manage the transition to a greenhouse gas constrained future.

http://www.co2e.com/

The **World Bank** Community Development Carbon Fund links small-scale carbon projects with companies looking to fund offset projects. The fund became operational in July 2003 and is currently reviewing potential project in least-developed countries and in poorer communities of all developing countries: http://carbonfinance.org/cdcf/home.cfm

Stonyfield Farms Yogurt purchases carbon offsets to maintain 'climate neutral' emissions levels http://www.stonyfield.com/EarthActions/ClimateChange.cfm

California-based companies that buy carbon offsets can be found through the **California Climate Action Registry**

http://www.climateregistry.org/Default.aspx?refreshed=true

Many other **private companies** and NGOs purchase offsets and credits, a list of some of these companies can be found at:

http://www.pewclimate.org/companies_leading_the_way_belc/company_profiles/index.cfm

In countries with weak or developing capital markets, environmental funds may provide financing for environmental investments and business development at attractive (subsidized) financing terms for organizations with poor access to capital.[9] This type of support reduces polluters' costs and creates incentives for facilities to address environmental problems ahead of compliance deadlines or compensate for weak environmental enforcement capacity that is pervasive in developing countries (Anderson and Zylicz, 1995).

As institutions, environmental funds can play an important role in strategic planning, cooperating with government agencies in the identification of priorities and the structuring of the fund's disbursement policies to achieve priority goals and objectives. Funds can also help to develop capacity in the private sector and among NGOs to prepare projects and undertake financial planning. As will be discussed later in the paper, environmental funds often provide considerable scope for public participation in governance and their procedures are structured to promote transparency and accountability. Thus, funds may demonstrate these important principles and serve as a catalyst for government agencies to accommodate public participation and access to information.

Types of Environmental Funds

There are a number of ways that environmental funds can be classified to distinguish key differences. They can be defined in terms of the major uses of resources (e.g., environmental protection or investment, conservation, or parks) or in terms of their major source of funding (e.g., debt-for-environment swap). The three types of funds in terms of their disbursement activities are revolving funds, non-revolving (sinking) funds and endowment or conservation trust funds (discussed in Section 3.3.4)

Revolving Funds – Revolving funds are funds that disburse their working capital in the form of loans and equity investments. Assuming high repayment rates on loans and positive rates of return on equity investments, the working capital "returns" to the fund as future revenues. Thus, the initial working capital is replenished over time.[10] Many of the national funds listed in Table 3.4 disburse a portion of their revenues in the form of loans or equity investments. Assuming that revenues from sources excluding loan repayments and investment earnings are constant over time, the working capital of the fund will increase as a larger proportion of disbursements are in the form of loans and investments. The best illustration of this principle is the National Fund for Environmental Protection and Water Management in Poland. This fund disburses 76% of its working capital in the form of loans (69.8%) and equity investments (6.2%). As a result, even though *other* revenue sources have been steady (mainly pollution fees and fines), annual revenues increased from $266.7 million in 1993 to $403.6 million in 1997. In 1997, loan repayments accounted for 37% of total revenues (OECD, 1999).

[9] While such funding is attractive to investors, considerable attention has been focused on the potential for such funding to crowd out commercial financing or to present an obstacle to the formation of new capital market instruments (Peszko and Zylicz, 1998; Anderson and Zylicz, 1999). Ideally, the level of subsidized support for projects should only be high enough to induce the investor to undertake an investment that would otherwise not be undertaken or delayed.

[10] This definition of a revolving fund conforms to the conventional treatment in OECD publications. In the GEF's evaluation of conservation trust funds (1998), a broader interpretation of a revolving fund is employed, albeit one that ignores disbursements, wherein a revolving fund is any fund that receives new revenues each year, whether from loan repayments, taxes, fees, or budget transfers. Under the GEF interpretation all of the funds listed in Table 3.2 would be considered revolving funds.

Table 3.4: Revolving and Non-Revolving Funds

Revolving Fund	Established	Revolving Disbursements (%)	Annual Working Capital (1997)
Russia - National Pollution Abatement Facility	1995	100%	$0.09 million
Slovenia - Environmental Development Fund	1994	100%	$20.4 million
Poland - National Fund for Environmental Protection and Water Management	1989	76.0%	$403.6 million
Poland - Cracow Provincial Fund for Environmental Protection and Water Management	1993	74.6%	$14.8 million
Russia - Federal Environmental Fund	1992	47.4%	$18.5 million
Czech Republic - State Environmental Fund	1992	43.9%	$167.1 million
Hungary - Central Environmental Protection Fund	1993	25.0%	$81.0 million
Bulgaria - National Environmental Protection Fund	1993	23.3%	$9.5 million
Bulgaria - National Trust EcoFund	1996	14.8%	$5.2 million
Estonia - Central Environment Fund	1990	10.4%	$7.7 million
Kyrgyzstan - Republican Environmental Fund	1992	7.2%	$0.5 million
Belarus - Republican Environment Fund	1993	0%	$5.1 million
Poland - EcoFund	1992	0%	$33.6 million
Slovak Republic - State Environment Fund	1991	0%	$31.0 million

Source: OECD, Sourcebook on Environmental Funds in Transition, 1999, pp. 14-17.

Non-Revolving Funds – Non-revolving funds disburse their working capital as non-repayable grants. There are two main types of non-revolving funds:

Sinking* or *wasting funds have a fixed amount of revenue to disburse and once this working capital is gone, the fund ceases operations. For example, the Polish EcoFund is a debt-for-environment swap, with debt-forgiveness revenues expected to accrue to the fund until 2012, at which point the fund would be dissolved unless new sources of revenue are proposed.

Sustained revenue non-revolving funds receive revenues on a annual basis and disburse these revenues in the form of grants. The State Environmental Fund in the Slovak Republic receives revenues annually from the state budget and environmental charges and fines and disburses these resources as grants.

Revenue Sources

Funds depend on revenues for their working capital. Revenues may flow to the fund at frequent or regular intervals or as one-time or limited term transfers. Two types of revenues are considered in this section. First, extramural revenues are those revenues that flow from sources outside of the fund. Second, fund income sources are revenues that are generated by the investment activities of the fund, using its own working capital to earn a rate of return from interest-bearing accounts, investment earnings on the fund's endowment, and loans and equity investments in the environmental sector. The major sources of revenue for environmental funds have been described in Section 3.2.

The second category of revenue sources – fund income – involves the use of the fund's working capital to generate additional income. Generally, fund income is generated by investing the working capital in interest-bearing accounts or other investment opportunities (earning higher rates of return), or by making disbursements to environmental projects in the form of loans or equity investments. While both types of activities are designed to generate income for the fund, this is a secondary goal for the disbursement options, which are designed to generate environmental benefits by supporting environmental projects and environmental businesses. Table 3.5 provides an overview of each of the revenue mechanisms that can generate fund income.

Table 3.5: Options for Generating Fund Income

Interest-Bearing Accounts	
Description:	Earnings on unspent fund balances in interest-bearing bank accounts; typically short-term rates apply for revolving and non-revolving funds to ensure resources are liquid
Examples:	Most environmental funds are able to earn income from bank accounts
Environmental Benefits:	None
Asset Management	
Description:	Investment of a fund's endowment, often in a portfolio combining financial instruments
Examples:	Conservation Trust Funds, other endowments
Environmental Benefits:	If portfolio stipulates investments in "green" funds or stocks
Loans	
Description:	Loans provided to fund applicants to finance pollution abatement and other environmental projects; typically, "soft" loans offered with favorable interest rates and other loan terms
Examples:	"Soft" loans (Polish National and Regional Funds, Russian NPAF, Slovenia Environmental Development Fund, Lithuanian and Latvian Environmental Investment Funds)
Environmental Benefits:	Access to "soft" loans strongly linked to potential of proposed project to generate environmental benefits
Equity Investments	
Description:	Fund takes an equity position in start-up environmental businesses, for example, development of local source of pollution control equipment
Examples:	Polish National Fund, Russian Federal Environmental Fund, Bulgaria National Fund
Environmental Benefits:	Indirect benefits may result if start-up companies can provide environmental goods and services at lower cost than foreign vendors

Disbursement

The disbursement of revenues for environmental activities is the defining characteristic of environmental funds. Often, the ability of funds to sustain revenues and receive the public's and government's support will depend on whether disbursements are viewed favorably in terms of the benefits associated with the projects receiving fund support.

There are five types of disbursement mechanisms that have been used by environmental funds. These are grants, "soft" loans, interest rate subsidies, loan guarantees, and equity investments. Of these five mechanisms, grants are the most common used for protected area financing while the other mechanisms are more commonly used to finance environmental infrastructure associated with infrastructure and soft loans are by far the most common forms of disbursement.

A grant represents a direct transfer of funds from the source to the recipient. It is transparent and does not require repayment by the recipient, although other conditions may be attached to the grant by the source (e.g., repayment if the facility does not apply the grant for the intended/contracted purposes). Virtually all conservation trust funds and most environmental funds disburse all or some of their resources as grants. Grants are simple to administer and involve little financial risk for the fund.

Types of Projects
The types of protected area expenditures that may receive support from environmental funds are described in Table 3.6.

Table 3.6: Types of Protected Area Activities Supported by Funds

Type of Activity	Description
Management support	Direct support for staff and equipment needed to manage parks, protected areas, restore habitats, provide complementary infrastructure (grants)
Land Acquisition	Purchase of land for parks and protected areas, habitat protection, buffer zones; could also include purchase of development rights to keep land in current undeveloped uses (grants mainly)
NGO Capacity	General support for staff, buildings, and equipment, capacity building of staff through training (grants)
Education and Awareness	Support for environmental education and awareness programs, administered by agencies, local governments, NGOs, universities, and schools (grants)
Research	Support for environmental research, typically to universities, research institutes, and NGOs (grants)
Training	Support for natural resources training to increase capacity of institutions and stakeholders (grants)
Habitat Restoration and Protection	May involve some capital and infrastructure investments, species propagation, etc.

Disbursement Policy Issues
While environmental funds can be beneficial in addressing shortfalls in public budgets and weaknesses in capital markets, these advantages may be negated by lack of attention to the guiding principles of ***accountability*** and ***transparency*** in disbursing fund resources. The discussion below reflects the best practices elaborated in the *"St. Petersburg Guidelines" in Environmental Funds in the Transition to a Market Economy* (OECD, 1995). These guidelines were prepared by the OECD and vetted with representatives of CEE environmental funds, donors, and IFIs at a workshop in St. Petersburg, Russia in 1994.

Accountability is demonstrated by a disbursement program designed to allocate funding to the highest valued (socially) or best environmental uses. There are several design issues that can increase accountability:

Clearly defined priorities – Disbursement programs should be guided by a set of funding priorities developed collaboratively by the fund, environmental and other government agencies, and stakeholders. Typically, priorities should be set before the first disbursements are made, then updated on an annual or biannual basis. Disbursements should be evaluated in terms of criteria that include priorities, project quality and benefits, etc.

Environmental benefits and cost-effectiveness – Environmental funds should require applicants to indicate the nature and (if possible) the magnitude of environmental benefits generated by proposed projects. In addition, applicants should be encouraged to achieve these benefits at lowest costs, thereby increasing the number of projects that can be supported and the level of aggregate benefits achieved.

Additionality – to the extent possible, the support provided by funds should be in addition to resources that applicants can raise from other sources.[11] Generally, it is difficult for a fund to determine whether its support is additional on a project-by-project basis. However, several design elements can be adopted that encourage applicants to request no more funding than they need (e.g., covering less than 100% of project costs, ranking projects higher that mobilize co-financing, setting funding ceilings on individual projects.

Project monitoring and evaluation – Once projects are awarded, the fund must closely monitor implementation to ensure its resources are utilized for the purposes proposed and to determine if the project achieves its anticipated benefits.

Transparency in a fund's disbursement program is achieved by conducting the "project cycle" in an open, clear, and non-arbitrary manner. Design issues that promote transparency include the following:

Outreach/awareness campaign to publicize fund, application process – Such a campaign also improves accountability by providing a larger pool of projects from which to select funded projects.

Project cycle procedures available for public review – Applicants should have information on how to apply, the documents that should be submitted, the criteria that will be used to evaluate applications, and the selection process. In addition, applicants of funded projects should understand the requirements for submission of invoices, reports, and inspections. An illustration of the project cycle is provided in Table 2.6.

Open communications with applicants – The fund should provide opportunities for applicants to submit questions about the application process. The fund should inform applicants of any deficiencies in their application packages and provide written notice of rejection/acceptance of applications following review and selection.

Annual report – Funds should prepare annual reports to inform the public of the funds activities during the year. This report should provide information on the number of projects accepted and rejected. Many funds also list the projects that were reviewed (accepted) during the year.

3.3.4 CONSERVATION TRUST FUNDS

A conservation trust fund is an endowment that has the potential to generate an annual revenue flow in perpetuity through the investment of the amount of the endowment in income-earning securities and other financial assets. Typically, the trust fund's endowment is generated from a bilateral grant, donations, or from a debt reduction mechanism. Many of the endowments that have been established in the last decade have involved an initial grant from USAID or GEF that constitutes the major portion of the endowment. Table 3.7 describes many of the conservation trust funds that have been established with capital provided by USAID and/or GEF. Typically, the investment return on these endowment funds is between 5% and 10%. Note that the Latin American funds in Table 3.7 are part of RedLAC – the Latin American and Caribbean Environmental Funds Network with combined assets of over $150 million for conservation in 27 funds in the region.

Depending on the conditionalities placed on these foreign grants (or other sources of revenue) by the recipient and/or donor governments, endowment funds may invest in either domestic or foreign securities and other financial instruments. As a general rule, a board of trustees guides the fund's investment policies and the fund's endowment is managed by an investment/asset manager rather than by staff of the fund.

[11] This is a broader definition of additionality than is commonly used by GEF. GEF support is ideally focused on project components that yield public benefits over and above those that the project investor would receive. For example, while a facility might install pollution control to meet local environmental standards, investment to address non-regulated greenhouse gas emissions or achieve significantly greater pollution reductions than required by the standard would be viewed as additional.

Table 3.7: Conservation Trust Funds

Fund Name	Established	Source of Funding	Funding
Bhutan Trust Fund for Environmental Conservation	1991	GEF	$10.0 million
Cordillera Development Fund (Costa Rica)	1990	USAID	$10. million
Ecological Trust Fund (Panama)	1995	USAID	$8.0 million
Foundation for the Philippines Environment	1992	USAID	$18.0 million
Fund for Natural Areas Protected by the State (Peru)	1992	GEF	$5.2 million
Honduras Environmental Trust Fund	1993	USAID	$10.0 million
Indonesia Biodiversity Foundation (KEHATI)	1995	USAID	$21.5 million
Madagascar National Environmental Endowment Fund	1996	USAID	$6.0 million
Mexican Nature Conservation Fund	1994	GEF, USAID, GoM	$70.0 million
Mgahinga-Bwindi Impenetrable Forest Conservation Trust	1995	GEF	$4.3 million
Table Mountain Fund (South Africa)	1993	GEF	$5.0 million

Sources: GEF, Evaluation of Experience with Conservation Trusts, 1998, p.4; and Page, K., 1998-1999 Update on USAID-Supported Environmental Endowments, 1999, pp. 30-34.

3.3.5 PAYMENT FOR ENVIRONMENTAL SERVICES (PES)

Payment for environmental services (PES) is a recent innovation that entails compensation of owners or managers of protected areas and other ecosystem resources for the provision of services that are not normally marketed. PES can cover any of the four types of services described in Chapter 2:

Provisioning services (food, natural medicines and pharmaceuticals, fuel wood, water, minerals)

Regulating services (air quality maintenance, climate regulation, water regulation, erosion control, water purification, risk mitigation)

Cultural services (cultural diversity, aesthetic values, heritage values, recreation)

Supporting services (primary production, soil formation, oxygen production, pollination, habitat provision)

Most often, PES involves an annual payment in return for the provision of specific ecosystem services. Annual PES works reasonably well unless the recipient is required to make large upfront investments in order to provide the desired services. In a few cases, the PES does not involve the exchange of money but exclusive rights to a stream of income.

PES can provide financial incentives for resource managers to undertake conservation efforts that would not otherwise take place because of the additional costs or the income foregone. PES programs also address the increased desire for global environmental services such as carbon sequestration and for increasing the supply of environmental services of local or regional interest.

While the earliest PES programs were designed to compensate private landowners or defray the management costs of watersheds and protected areas, some recent PES programs are designed to strengthen rural livelihoods. In this case, communities in or near the protected area are compensated for their participation in co-management schemes or to discourage illegal harvesting and protected area encroachment. Some of the arguments for compensating poor rural communities include the following:

Communities are often inside protected area boundaries or have traditionally relied on the resources of newly created protected areas and it may be difficult to exclude them; community groups have often been successful in pressing for rights of access, therefore PES can provide a mechanism to insure that communities protect the resource and contribute to effective management of protected areas.

(Equity consideration) Conservation schemes that do not fully integrate the social objective of poverty reduction with the environmental objectives can become instruments of exclusion.

PES has been used for three main purposes: 1) watershed protection; 2) compensation to local protected area communities; and tree planting and carbon sequestration.

Watershed protection – In **Indonesia**, the Sungai Wain Watershed Protection User Charge was levied on users and a portion of the charge was used to protect the watershed from encroachment and destruction by financing the development of non-consumptive additional uses of the watershed such as tourism. In **Costa Rica**, local PES initiatives have focused more on services such as protecting water resources, with more flexible criteria that increase participation of smale-scale producers. One PES program paid for PES by charging water customers an "environmentally adjusted water rate." An extensive PES in three Central American countries is described in the box below.

Payment for Hydrological Services in Central America

PASOLAC's mission is to increase small- and medium-scale producer incomes in the hillside regions of El Salvador, Honduras and Nicaragua. The Program's working goal is to promote the adoption of sustainable soil and water management on farms owned by small-scale producers, its principal clientele. In pursuit of its objectives, PASOLAC works with over 50 institutions which include groups of producers, districts, NGOs, GOs and higher education centers. As of the year 2000, PASOLAC has been implementing pilot actions for the payment of hydrological services (PHS) in El Salvador, Honduras and Nicaragua through municipalities interested in developing these mechanisms. By means of this perspective, the Program seeks to develop local markets with environmental supply and demand with an emphasis on hydrological services.

Ten PES pilot actions are currently being executed in the three countries. Of these, seven pilot projects are executed with the leadership of municipal governments or corresponding municipal water companies. In Nicaragua, PES actions are being carried out in the Districts of Achuapa, San Pedro del Norte, Río Blanco and Estelí (El Regadío). In El Salvador with the districts of Tacuba, La Palma/San Ignacio and the districts of Sensembra, Guatajiagua and Yamabal. In Honduras with the Barrio Municipal Water Board and the Municipal Water Board of Jesús de Otoro. In addition, in Nicaragua a PES scheme is being implemented by a consortium which involves the Esteli National Water and Sewer Company, the District, the National Forestry Institute (INAFOR) and a private development organization. In this intervention area several techniques have been introduced to contribute to the sustainable management of soil and water. Among the techniques introduced are the elimination of burning, the management of stubble, natural forest regeneration through selected thinning, coffee cultivation management, conservation of the regenerated forest, the introduction of living barriers with different species and the composting of coffee pulp to avoid the contamination of water sources by coffee production. To date, agreements have been signed between producers from upland areas and institutions in charge of PES administration in San Pedro del Norte (Nicaragua), Tacuba (El Salvador) and in Campamento and Jesús de Otoro (Honduras).

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Compensation to local communities – In **Brazil**, the ICMS Tax program earmarks a portion of the national sales tax to be divided among municipal areas in relation to the area in protected area status. The ICMS Tax has provided some relief but the amount of the tax has been insufficient compensation for the value of incomes lost because of protected area designation.

In **Egypt**, local Bedouin tribes near Wadi El-Gemal National Park do not receive financial compensation for their role in park conservation. Rather they are provided exclusive rights to operate ecotourism activities (after the environmental authority established a policy to prohibit mass tourism).

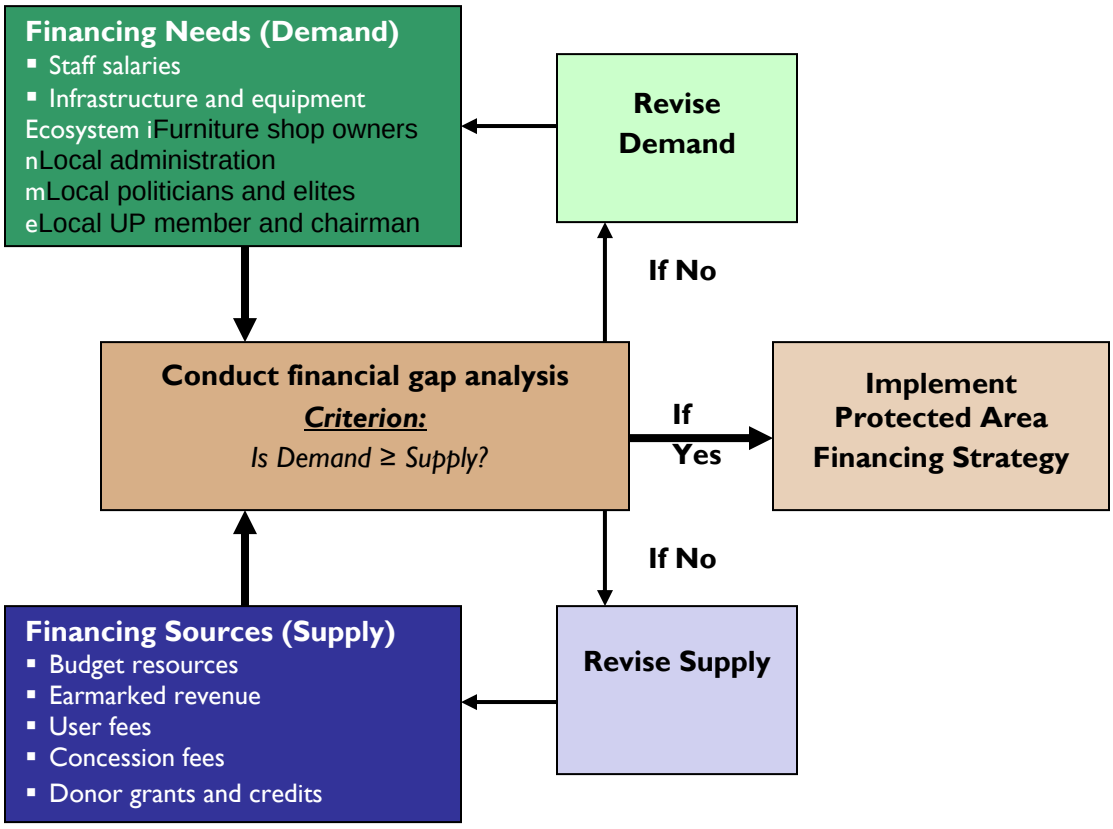
Tree planting and carbon sequestration – In **Costa Rica**, there has been a PES program under the National Forestry Law (financed by tax on fossil fuels) since 1996. Between 1997 and 2002, 314,472 hectares were covered by the program with total payments of $80.5 million, with 70% for forest protection. The program didn't benefit smallholders or extend benefits to agro-forestry activities until 2003. In **Mexico**, 300 farmers in Chiapas are planting trees on a portion of their land to sequester carbon after the International Automobile Federation purchased 5500 tons of carbon offsets.

CHAPTER 4
RECOMMENDED FINANCING OPTIONS FOR BANGLADESH

In this chapter, we examine options for financing protected area management in Bangladesh. Section 4.1 provides a framework for analyzing financing needs and sources. This framework has been adapted from the methodology developed by Anderson and Semeniene (2001) and applied to the national environmental financing strategy of Lithuania. Section 4.2 describes the perceived protected area financing needs in Bangladesh, while Section 4.3 describes current sources of protected area finance. The final section presents recommendations for financing protected area management in Bangladesh.

4.1 FRAMEWORK FOR EVALUATING FINANCING OPTIONS

The basic protected area financing problem is to identify and mobilize adequate financial resources to meet the costs of protected area management. The diagram below illustrates the basic approach to the financing problem.



Financing Needs (Demand) – This is the sum of financing needs or expenditures to achieve the objectives of protected area management. These financing needs include recurring expenditures such as staff salaries, operational and maintenance costs, etc. as well as investment expenditures such as equipment, land acquisition, and construction of infrastructure. The demand for financing should be time-dimensioned since some of the financing needs can be spread out over time.

Financing Sources (Supply) – This is the amount of funding that can be raised from all financing sources. It includes government budget resources and earmarked revenues such as user charges, loans, grants, and donations. All of these financing sources have conditions placed on their availability, who is eligible to use them, and the range of financing needs that can be funded.

Financial Gap Analysis – Once the initial financing needs and sources have been estimated, the next step is to conduct a financial gap analysis to determine if there is adequate financing to cover estimated needs. In the diagram, the criterion applied in the financial gap analysis is whether demand (needs) are greater than or equal to supply (sources). As the environmental financing framework is often applied to multi-year problems, the gap analysis looks at potential shortfalls for each year and for the entire planning period.

Revise Demand and/or Supply – The next step in the framework depends on whether or not there are gaps. Typically, there will be a gap or supply shortfall and the next step is to revise demand and/or revise supply (i.e., mobilize additional financing sources). Reducing demand can take two forms: 1) reducing the financing needs for the entire planning period; or (2) introducing delays in the timing of some expenditures such as investments. The second option suggests that the major obstacle is raising adequate resources for investments in the immediate future. On the supply side, the challenge is to increase the amount raised from alternative sources. Typically, this involves augmenting budget resources with loans or external sources such as donor grants. Once these adjustments have been made and the financing strategy can be implemented.

4.2 PROTECTED AREA FINANCING NEEDS

At present, there is no comprehensive assessment of protected area financing needs for Bangladesh. Less than one-third of the protected areas have prepared management plans and these plans do not necessarily cover all of the financing needs that have been identified in recent assessments, for example Mitchell et al. (2004). At a minimum, the Forest Department will face a financing challenge to simply to meet current financing needs once the ADB support for the Forest Department ends in June 2006. The approach of this section will be to present an overview of current protected area management support and highlight the additional financing needs that have been identified.

4.2.1 PROTECTED AREA STAFFING NEEDS

The Forest Department has established the Wildlife and Nature Conservation Circle (WNCC) and allocated 378 positions to the four regional divisions and two botanical gardens (Mitchell et al., 2004). Of these, only 105 positions are technical positions, and in 2004, 45% of the technical positions were vacant. Of the total staff positions, only 70% were filled and more than half of these positions were staff for the two botanical gardens. With 30 of the WNCC allocated positions placed elsewhere in the Forest Department, only 229 Forest Department staff is dedicated to protected areas. While protected areas represent 16% of land area under the management of the Forest Department, less than 5% of Forest Department staff is assigned to the WNCC. Table 4.1 provides a summary of the staff positions for the four Wildlife and Nature Conservation Divisions (excludes staff for the botanical gardens).

Table 4.1: Staff Positions for the Wildlife and Nature Conservation Divisions

Name of Post	Dhaka	Chittagong	Sylhet	Khulna	Total
Conservator of Forests	1				1
Deputy Conservator of Forests	1	1	1	1	4
Asstt. Conservator of Forests	3	5	3	4	15
Forest Ranger	5	6	3	5	19
Deputy Ranger	2	3	2	4	11
Forester	6	12	4	8	34
Forest Guard	15	19	8	13	47
Boat Man	2	4	-	10	16
Plantation Mali	5	5	5	5	20

Officer = 20 positions

Staff = 147 positions

Total = 167 positions

Mitchell et al. (2004) have recommended increases in WNCC staff including technical backstop staff in Dhaka and additional technical staff in the field with training in a variety of biological and social sciences. Other assessments (see, for example, Studd, 2004) have highlighted the weaknesses in PA enforcement against illegal timber and fuelwood harvesting. More staff is needed for patrols and to prepare court cases against violators but increased staffing alone won't reduce illegal activities.[12]

4.2.2 OTHER PROTECTED AREA FINANCING NEEDS

Apart from staff, protected areas have a large number of unmet demands. Vehicles that are vital to protected area patrols are assigned to district offices and are not available to protected areas on a regular basis. Other recurring costs for protected areas include utility costs, funds to prepare enforcement documents, telephones, equipment for building and maintaining trails, bridges and infrastructure.

Donor programs such as ADB-funded Forestry Support Project and the NSP have provided some funding for improvements to natural resources in protected areas (reforestation, restoration of damages areas), construction of new infrastructure, procurement of signs and trail maps and markers, and education and awareness campaign materials. The Government of Bangladesh also finances or co-finances special projects to improve protected areas. Table 4.2 provides a summary of recent GOB and donor-funded projects to support protected area improvements.

[12] Patrols are currently poorly equipped with vehicles to adequately monitor activities in the park. There are also problems of covering the costs of preparing an enforcement action, personal safety issues associated with prosecution of local elites involved in illegal logging, allegations of bribes, and spotty cooperation of the Bangladesh Rifles in joint enforcement actions. In addition, the poor who are caught can only finance their fines by engaging in continued illegal activities.

Table 4.2: Protected Area Projects

Project Name	Funded by:	Duration	Project cost (USD)	Description
Experimental Development of Agar Plantation	GOB	6 years	$509,860	Develop agar plantation to supply raw materials to perfume industry
Bamboo, Cane and Morta Project	GOB	7 years	$5.14 million	Plantation development and maintenance
Modupur National Park Development Project	GOB	6 years	$1.71 million	Extension of facilities, reforestation, development of wildlife breeding center, plantation development of non-timber products
Establishment of Eco-Park at Madhobkunda & Mooraichara Waterfall	GOB	4 years	$610,000	Development and conservation of area, watershed management, creation of area for wildlife
Denuded hill reforestation at Ramgar and Sitakunda	GOB	4 years	$2.74 million	Develop forest resources in denuded hill tracks
Kaptai National Park Development Project	GOB	4 years	$1.55 million	Wildlife habitat improvement, creation of wildlife breeding center
Dulaharza Safari Park	GOB	2 years	$1.50 million	Create habitat for migratory birds, improve breeding center
Biodiversity conservation & development project at Banshkhali	GOB	2 years	$927,000	Develop facilities for education and research, create migratory bird habitat
Nishorgo Support Project	USAID GOB	4 years	$10.9 million	Develop co-management model, strengthen institutional systems, build or improve PA infrastructure
Behavior and ecology of the tiger in Sundarban Reserve Forest	US F&WS	1 year	$121,000	Observational study of tiger's home range and habitat

One of the major financing needs for protected areas is a replanting/reforestation effort needed to restore trees to the largely denuded protected areas. In 1997, the World Bank noted that only 6% of forestland had tree cover of at least 20% and in recent years, this number has increased, especially in protected areas such as Teknaf and Chunati. Reforestation efforts are needed both in the designated protected areas and in the buffer areas surrounding the protected areas.

4.2.3 CO-MANAGEMENT AND PAYMENT FOR ENVIRONMENTAL SERVICES

One alternative to direct funding of Forest Department staff and associated protected area management costs is co-management and/or payment for environmental services. Co-management may yield significant cost savings over direct funding, utilize underemployed and unemployed members of local communities, and reduce the likelihood of illegal harvesting by engaging community members in management activities. Co-management also provides an opportunity to increase awareness among participating communities of the threats to and values of protected areas. Payment for environmental services (PES) is typically used to compensate landowners or managers for providing non-marketed services. However, PES can also be used to compensate communities for their loss of income due to protected area designation and restrictions on harvesting activities.

One of the challenges in using a co-management or PES scheme is determining the level of expenditure that is necessary to meet protected area management objectives. In addition, there is a dynamic problem that must be addressed. If a protected are has been largely denuded, the protected area will have limited value for timber an d fuelwood harvesting. As the protected are recovers through co-management and reforestation, the value of timber and fuelwood will increase, increasing pressure for harvesting. Thus, the co-management or PES scheme requires careful intertemporal design, both in terms of payment and in terms of the management effort needed to patrol the protected area.

4.2.4 SUMMARY OF FINANCING NEEDS

At this point in time, it is not possible to fully assess protected area financing needs in Bangladesh. Most of the protected areas do not yet have management plans and it is not clear that the management plans developed so far have attempted to evaluate what they need for effective management as opposed to what they can expect to receive in the current budgetary process. With the exception of the commitment to WNCC staff allocations, all other protected area expenditures must compete with other Forest Department expenditures. With the ADB-funded Forestry Sector Project (FSP) ending in June 2006, and the $82.2 million Sundarbans Biodiversity Conservation Project cancelled,[13] the Forest Department will be faced with a financing gap of approximately $10-15 million per year to continue the various activities funded by the ADB and GEF.

Approximate annual funding of Forest Department expenditures by the FSP over the 8-year project period are as follows (for the major expenditure categories):

- Afforestation - $2.29 million/year
- Construction works - $609,000/year
- Consultants - $552,000/year
- Training - $486,000/year
- Pre-construction costs - $283,000/year
- Equipment - $232,000/year

With the FSP project ending, the Forest Department will likely economize on some expenditure categories such as consultants and training abroad and will not need to replace ADB funding on a dollar to dollar match. Nevertheless, the financing gap to maintain the status quo will likely be $3-5 million per year, excluding expenditures related to the Sunderbans Project. Absent an influx of budget resources, these funding needs will need to be financed from new sources.

4.3 CURRENT AND POTENTIAL SOURCES OF PROTECTED AREA FINANCING

In assessing current and potential sources of financing for protected area management, it is important to recognize that sources may be suitable for a limited number of financing needs. For example, donor loans, grants, and environmental fund mechanisms are not typically used for staff salaries but rather for project-specific expenditures. The one notable exception is the use of grants or debt reduction to capitalize environmental or conservation trust funds. Table 4.3 illustrates the typical types of expenditures for which current and potential sources of protected area financing might be most appropriate.

[13] The Sundarbans Project was initially suspended then cancelled when the GOB did not comply with the three conditions stipulated by the ADB to restart the project. In the GEF project summary, it was noted that the critical condition concerned the reconciliation of financial management deficiencies (see http://www-esd.worldbank.org/gef/projectDetail.cfm?ID=471&projectSize=RP)

Table 4.3 Current and Potential Uses for Sources of Financing

Protected Area Expenditure Category	Budget Resources	Donor Grants	Donor Loans	Earmarked Taxes and Fees	User Fees	Environmental Funds	Donations
Staff salaries and benefits	C			P			
Recurring operational costs	C			P	P		
Natural resource improvements	C	C	C	P	P	P	P
Equipment	C	C	C	P	P	P	P
Infrastructure	C	C	C	P	P	P	P
Co-management/PES	P			P	P	P	P

C = Current
P = Potential

4.3.1 BUDGET RESOURCES

Protected areas are the management responsibility of the Forest Department in the Ministry of Environment and Forest. Budget resources are utilized for the payment of staff salaries and benefits, purchase and maintenance office and field equipment, and to cover the costs of maintaining and improving natural resources and physical infrastructure in the forest and protected areas managed by the Forest Department.

Since 1997, it is difficult to separate out expenditures for protected areas from those for other Forest Department activities with two notable exceptions: 1) WNCC allocated staff positions and 2) protected area projects (see Table 4.1). Budget resources for the Forest Department and WNCC must compete with other budget priorities – within one or two budget cycles, it may be difficult to increase the Forest Department's budget to fully replace the financing provided for the last seven years by the ADB through the Forestry Sector Project. The key challenges for the Forest Department will be to sustain the:

Social forestry programs – the afforestation and plantation programs administered by the Forest Department continuously since 1981 have been funded by a series of ADB loans and donor grants. The current social forestry program is supported by the ADB FSP. The social forestry programs have been highly successful in meeting biomass demands of local communities and generating incomes through the benefit-sharing mechanism (participants share 25% to 55% of program benefits depending on the specific program). With a focus on lands outside of protected areas, these programs can reduce the pressure on illegal harvesting in the protected areas.

Development and improvement of protected areas and nature-based parks and botanical gardens – investments in park infrastructure in the last few years have immediately resulted in increased visitation and revenues from user fees and park concessions. With the anticipated shortfall in overall Forest Department budget, resources for projects may be shifted to cover more immediate equipment and recurring operational cost needs.

4.3.2 DONOR LOANS AND GRANTS

Donor loans and grants are typically used to finance non-recurring protected area expenditures such as tree planting, infrastructure, and equipment acquisition. Donor grants may also be used to finance management plans and technical assistance and capitalize environmental or conservation trust funds.

As noted above, the ADB loan will be completed June 2006. At this point in time, the Government of Bangladesh has not applied for a new ADB loan to support the Forest Department or requested loan support from the World Bank. Thus, there is no pipeline of donor credit envisioned to supplement other sources when the ADB loan terminates.

Worldwide, the Global Environment Facility is the major source of grant support for biodiversity conservation and protected area management. In addition to the $12.2 million in grants for the Sundarbans Project, the GEF had also funded the Coastal and Wetland Biodiversity Management Project at Cox's Bazar and Hakakuki Haor ($6.2 million). The only major active donor grant program is the USAID-funded Nishorgo Support Project. The NSP is a four-year $9 million project that provides $6.5 million in technical assistance and $2.5 million in local currency.

As a result of the Sundarbans Project's cancellation, interest in new grant funding by GEF can be expected to be limited, at least in the near term (see Section 4.4 on recommendations for rebuilding GEF interest in Bangladesh projects). As the NSP project will continue until May 2008, some grant support will be available for the five project areas that are the focus of the NSP. Overall, donor grants appear unlikely to play a significant role in PA financing in the near future.

4.3.3 EARMARKED TAXES, CHARGES, AND FEES

There are numerous options for creatig a financial earmark for PA management in Bangladesh, provided there is adequate political support. The most likely earmarks include water utility surcharges (to "compensate" protected areas for water regulation and purification services), pollution charges, and energy/fuel taxes or surcharges. The amount of funding that needs to be generated for PA management in Bangladesh is modest in comparison to the revenues that any of these earmarks could generate.

However, at present, Forest Department revenues from timber sales and PA entry fees and concessions are not earmarked for FD or WNCC purposes but revert to the Treasury. Thus, there is no precedent for earmarking current revenues or for considering new earmarks. From a public finance perspective, there are advantages and disadvantages to earmarks. The main advantage of earmarks is that they are reasonably reliable and certain in terms of the annual revenue they can generate. This secure source of funds can facilitate investment in staff and multi-year activities such as habitat restoration and infrastructure improvements that might be risky if budgets fluctuate widely from year to year. On the other hand, public finance best practices call for allocations to be determined on a government-wide scale to ensure that resources are devoted to the highest valued (in political, social, and economic terms) uses. Thus, earmarks do not compete with other priorities. Given the clear imperfections and rigidities in the budgeting process in most developing countries, the public finance concerns about earmarking (especially for the small amounts involved in PA financing) seem tepid.

4.3.4 PROTECTED AREA USER FEES

At the present time, entrance fees are not charged at most of the national parks, the wildlife sanctuaries, or the game reserve in Bangladesh. The safari park, eco-parks, and botanical gardens charge modest entrance fees ranging from 5 to 10 Taka for adults or about 8 to 16 cents based on a conversion rate of 63 Taka per USD. There are also entry and parking fees for cars, mini-vans, and buses in the more popular parks and botanical gardens.

In the last few years, the growth in demand for the protected areas has increased dramatically, in part as a result of the completion of new infrastructure and the addition of new wildlife attractions. As noted in Section 2.2, the Dulhazara Safari Park and Sitakunda Botanical Garden and Eco-Park together may attract more than 75,000 visitors on a busy weekend. Although we do not have reliable information on visitor days for all the protected areas that collect entrance fees, it appears there are more than 2 million visitors per year. However, with the modest entry fees, revenues from entry fees and concessionaire fees (in parks where the Forest Department receives a concession fee instead of the gross receipts) are still quite modest.

The Forest Department also maintains a number of guest houses and cabins and collects daily fees from this source. At this time, we do not have information on the number of rental days or the revenue from this source, only information on the rental rates for specific guest houses and cabins (see Table 4.4), and fees for picnic spots ($4 or $9, depending on season), and daily cinema shooting fees ($79 or $87, depending on season). As can be seen from the table, these rental units could provide substantial revenue for the Forest Department.

Table 4.4: Guest House Daily Rates – Dhaka Forest Division

Rest House (RH)	16 March to 31 October	1 November to 15 March	Rest House (RH)	16 March to 31 October	1 November to 15 March
Jeshmin Rest House	70	140	Chamelee Cottage	7	14
Orchid Rest House	61	122	Belee Cottage	7	14
Champa Rest House	87	175	Bokul Cottage	7	14
Rajani Gondha RH	61	122	Jui Cottage	7	14
Sapla RH	26	52	Anondo - 3 Cottage	7	14
Maloncho RH	13	26	Anondo - 2 Cottage	5	10
Chandra RH	9	17	Anondo - 1 Cottage	5	10
Baroipara RH	9	17	Salna Cottage	5	10
Rajendropur RH	7	14	Sripur Cottage	5	10
Cottage - 1	7	14	Sranti Cottage	5	10
Cottage - 2	7	14	Key Cottage	5	10

Source: NSP, 2005

4.3.5 ENVIRONMENTAL AND INVESTMENT FUNDS

At present, Bangladesh has one environmental fund dedicated to financial support for protected areas. The Arannayk Foundation was established as a joint initiative of the Government of Bangladesh and the U.S. to facilitate the conservation, protection, restoration, and sustainable use of tropical forests in Bangladesh. Bangladesh is one of eight countries that have restructured U.S. debt under provisions of the Tropical Forest Conservation Act. The primary source of financing for the Arannayk Foundation is the revenue from the reduction of debt owed to the U.S. related to agricultural trade. In lieu of making repayments to the U.S. over a 19-year period, the GOB will instead make payments to the Foundation. The total value of the debt reduction over this period is $6 million. With interest savings, the Arannayk Foundation will receive $8.5 million.

The Arannayk Foundation has considerable flexibility in programming its working capital and can support initiatives of NGOs, community and private sector groups. The Foundation can provide financial support for studies and research, habitat restoration and other investments to improve tropical forests, and education and awareness. The Foundation also has the flexibility to mobilize resources from other sources beside the debt reduction mechanism and determine if annual revenues are utilized for current year expenditures or to increase the Foundation's endowment.

Another source of financing, albeit only for communities adjacent to protected areas, are the microenterprise and infrastructure funds that support small investments in rural communities of Bangladesh. The largest of these funds are the microenterprise operations of the Palli Karma-Sahayak Foundation (PKSF) and the small infrastructure lending operations of the Social Development Foundation (SDF). The PKSF works through Partner Organizations to support pro-poor lending programs. Through 2000, PKSF had disbursed more than $120 million to 2.13 million borrowers, 90% of them women (PKSF, 2001). The SDF has a broad lending portfolio and has supported small water and irrigation infrastructure projects, institutional development and community planning initiatives, and small private sector projects. More than 700 projects are underway or have been completed with SDF support (SDF, 2005).

Finally, under the NSP, a small loan program has been set up to complement co-management activities in the five NSP project areas. The Landscape Development Fund (LDF) has been capitalized as a revolving fund with working capital of $300,000. The LDF offers loans of upt to Tk 50,000, repayable in 24 months or less, with the main focus on support for alternative income generation (NSP, 2004).

4.3.6 DONATIONS

Donations are a largely untapped source of protected area financing in Bangladesh. As noted in Roy and DeCosse (2005), national and international companies have demonstrated interest in supporting protected areas. Glaxo-Wellcome financed a large tent to provide shade at the Sitakunda Botanical Garden and Eco-Park, the new Radisson Water Garden Hotel in Dhaka contributed to a PA conservation communications campaign of the Forest Department in 2004, and HSBC has financed an annual Earth Day photo competition centered on Bangladesh's protected areas. It should be noted that each of the examples involve contributions for specific project expenditures and all are visible, marketing opportunities for the businesses. In general, expansion of donation programs for businesses generally needs to cater to these types of private sector contributions. At present, individual donations are not a source of revenue for protected area management in Bangladesh

4.4 OPTIONS FOR FINANCING PA MANAGEMENT IN BANGLADESH

We turn now to the challenge of financing protected areas in Bangladesh. This challenge has both an immediate and a permanent component: in the near term, we need to address the imminent *financing gap* resulting from the loss of donor loans and grants but in the longer term, funding needs to be increased to levels that support effective management on a *sustained* basis. Bangladesh is not alone in trying to sustainably finance protected areas. Worldwide, the annual costs of providing for effective PA management are estimated to be $2.5 billion and $1.7 billion in developing countries. As developing countries' current expenditures on PA management are $0.8 billion, there is a substantial financing gap to be closed (Bruner, Hanks, and Hannah, 2003).

While the main focus of this section is to examine options for financing, we need to put fund-raising in its proper perspective. A new IUCN report elegantly states this point:

Fund-raising is a means to an end. Ultimately it is the effectiveness of PA management which determines how biodiversity is conserved, and whether PAs are financially sustainable. (IUCN, 2005)

The link between effective management and biodiversity conservation is quite clear but the link between effective management and financial sustainability merits addition discussion. Unless there is effective management, the ecological, social, and economic values of protected areas will be diminished making it increasingly difficult to carry out broad-based fund-raising to support protected areas. This point is particularly relevant in garnering support from donors, foundations and NGOs. In addition, poor management will limit visitation and the prospects for generating revenue from entrance and user fees.

Thus, in this section, we will first highlight a number of key non-revenue generating recommendations before turning to the fund-raising options. These recommendations are not intended to be exhaustive of all of the improvements needed for more effective PA management. Instead, we offer recommendations that are more closely linked and mutually reinforcing of the financing recommendations that follow.

4.4.1 STRENGTHEN PA MANAGEMENT COMMITMENT AND INSTITUTIONAL CAPACITY

In the last couple of years, considerable attention has been focused on strengthening protected area management in Bangladesh. Following an internal visioning exercise, the Forest Department developed the Nishorgo Program in 2004 to strengthen PA management. The Nishorgo Vision 2010 calls for a new institutional focus in PA management featuring improved skills, better management coordination and greater use of participatory processes to ensure sensitivity and responsiveness to the needs of PA communities and ethnic groups. The Nishorgo Program also calls for partnerships with local communities in the management of protected areas, and expansion of the geographical focus of protected areas to include the "landscapes" surrounding protected areas. The recommendations presented below for strengthening commitment to and capacity for PA management have been culled from various sources including the Nishorgo Vision 2010, a matrix on institutional capacity building needs (Mitchell et al., 2004), reports generated by the NSP, and the recent IUCN report. The list of recommendations is not intended to be exhaustive but focuses on those that relate to improved management **and** can make a positive contribution to financing.

Strengthen national commitment with a significant event or decision

One of the most important factors in attracting external financing (e.g., foreign loans and grants, foundation support) for protected area management is the perceived commitment to PA management. Donors place a great deal of emphasis on the likelihood of success in programming their assistance resources. As these resources are limited, Bangladesh must compete with other countries for donor support. The recent experience with the cancellation of the Sundarbans Project suggests that Bangladesh will need to demonstrate very strong commitment to PA management to rebuild donor support. While the Nishorgo Vision 2010 articulates a long term commitment to PA management, the process of restoring confidence in donors may require a *more visible, tangible, and significant event or decision* to complement strategic planning efforts. Some illustrative options for making such a demonstration of commitment include the following:

- Plan to increase and sustain an appropriate and effective PA staffing plan
- Introduction of a new source of financing such as earmarked taxes or charges dedicated to PA management
- Plan to earmark current protected area revenues
- Expansion of the protected area system both in terms of the number and total land area in protected areas
- Clearly, all of the options above are beyond the purview of the Forest Department. To wit, the demonstration of an enhanced commitment requires a government-level response

Strengthen capacity to carry out PA financial planning

Bangladesh needs to develop the capacity to prepare a financing strategy as described in the diagram at the beginning of this chapter. While a number of efforts have been launched to define effective management and determine the staffing and supporting expenditures needed for improved management (see Mitchell), it is difficult to mobilize financing without a clear vision of the financing needs to be covered by funding sources. At a minimum, recurring costs for staff and associated expenditures on transportation, facilities, communications, etc. need to be estimated for each protected area at levels that are deemed appropriate for effective management. Priorities also need to be established for non-recurring expenditures on infrastructure investments, habitat restoration, replanting programs, etc. and costs estimated for each priority expenditure. Finally, costs of supporting co-management activities need to be determined as well.

With this "demand" information, it will be possible to develop a financing strategy for protected area management. As funding sources would need to be developed over time, it might be necessary to phase in staffing, investment, and co-management support over several years. The structure of the financing strategy exercise is depicted in Table 4.5. For simplicity, an illustrative timeframe of five years is utilized beginning with 2006 and ending in 2010. However, a longer timeframe for the preparation of a financing strategy for PA management is recommended.

Table 4.5: Illustrative PA Financing Strategy

Expenditures, Funding, and Gap Analysis	Year				
	2006	2007	2008	2009	2010
Recurring Costs (RC)	RC_{2006}	RC_{2007}	RC_{2008}	RC_{2009}	RC_{2010}
Non-recurring Investment Costs (IC)	IC_{2006}	IC_{2007}	IC_{2008}	IC_{2009}	IC_{2010}
Recurring Co-management costs (PES)	PES_{2006}	PES_{2007}	PES_{2008}	PES_{2009}	PES_{2010}
Total Costs "Demand" (TC)	TC_{2006}	TC_{2007}	TC_{2008}	TC_{2009}	TC_{2010}
Funding for recurring costs (F_{RC})	F_{RC2006}	F_{RC2007}	F_{RC2008}	F_{RC2009}	F_{RC2010}
Funding for investments (F_{IC})	F_{IC2006}	F_{IC2007}	F_{IC2008}	F_{IC2009}	F_{IC2010}
Funding for co-management (F_{PES})	$F_{PES2006}$	$F_{PES2007}$	$F_{PES2008}$	$F_{PES2009}$	$F_{PES2010}$
Total funding "Supply" (F) = F_{RC} + F_{IC}+ F_{PES}	F_{2006}	F_{2007}	F_{2008}	F_{2009}	F_{2010}
Overall Gap Analysis = TC - F	TC_{2006} - F_{2006}	TC_{2007} - F_{2007}	TC_{2008} - F_{2008}	TC_{2009} - F_{2009}	TC_{2010} - F_{2010}
Recurring Cost Gap Analysis = RC - F_{RC}	RC_{2006} - F_{RC2006}	RC_{2006} - F_{RC2006}	RC_{2006} - F_{RC2006}	RC_{2006} - F_{RC2006}	RC_{2006} - F_{RC2006}
Investment Cost Gap Analysis = IC - F_{IC}	IC_{2006} - F_{IC2006}	IC_{2006} - F_{IC2006}	IC_{2006} - F_{IC2006}	IC_{2006} - F_{IC2006}	IC_{2006} - F_{IC2006}
Co-management Cost Gap Analysis = PES - F_{PES}	PES_{2006} - $F_{PES2006}$	PES_{2006} - $F_{PES2006}$	PES_{2006} - $F_{PES2006}$	PES_{2006} - $F_{PES2006}$	PES_{2006} - $F_{PES2006}$

Note: Gap analyses are specified for each type of expenditure because funding sources may be limited in terms of the types of expenditures for which they can be used.

The financing strategy exercise can provide useful information in discussions of support with donors, NGOs, and foundations. In addition to illustrating the financing gaps, the financing strategy, if prepared, would also help to demonstrate the government's resolve and commitment to effective protected area management and interest in improving and maintaining the stability and quality of funding, its timeliness, and administration.

Improve financial and information management systems
Based on our review of information on protected areas related to budget levels, sources of financing, revenues, and statistics on protected area visitation, there is a clear need to strengthen financial and information management systems as they relate to protected areas. Such information is vital to the preparation of the recommended financing strategy, for summarizing protected area management on an annual basis, and in approaching potential funding sources to seek support. In addition, the availability of data demonstrates stronger management capacity and a commitment to transparency, attributes that are of particular interest to donors.

The main recommendations related to financial and information management systems that are related to PA financing are as follows:

- Monitor and track expenditures for the WNCC and specific protected areas
- Develop a protected area visitation and use database to monitor trends in visitation and facilitate long term planning to expand services
- Monitor and track on a comprehensive basis protected area revenue and sources of financing

Involve a wider range of stakeholders in PA management.
This is essentially the approach taken by the NSP in promoting co-management and increased awareness of both protected area value and threats. As has been well-documented, co-management represents an opportunity to carry out some management functions and activities at lower costs than through increased staffing and management effort in the Forest Department and, by involving local communities, deter a portion of the illegal activities that undermine management efforts. Co-management approaches also have the potential to help mobilize sources of financing not normally available to government agencies such as foundation support and donations.

Another key benefit of involving a wider range of stakeholders in PA management relates to the value of understanding local concerns, priorities, and the relationship between local communities and protected areas. Dialogue between the Forest Department and local communities can be useful in identifying options for more effective PA management.

The other groups of stakeholders that need to have a greater involvement in PA management are other government bodies at the national and local levels whose responsibilities focus on economic development and poverty alleviation. To the extent that pro-poor programs target PA communities, they can help to reduce illegal activities through alternative income generation and by strengthening local communities' capacity for increased incomes.

4.4.2 IMPROVE SUSTAINABILITY OF THE SYSTEM OF PA MANAGEMENT FINANCING

One of the main PA financing challenges worldwide has been to organize PA financing on a sustainable basis. Many efforts to improve PA management start out well with an infusion of funding from donor grants and loans but fail to address either the transitional or sustainability problems of gap financing once these resources are exhausted. The root problem seems to be one of misplaced expectations. Developing countries, faced with many competing needs for state budget resources, hope that protected areas and biodiversity conservation are of sufficient importance among donors and international NGOs and foundations that they will continue to provide financing. International contributors to PA financing hope that partner countries will step up their funding so that PA and biodiversity resources can be shifted to new regions and priorities.

Donors have enjoyed some limited success in establishing conditionalities on partner countries in return for their financial support. For example, the World Bank has often required that municipalities commit to institutional strengthening and increases in user charges to ensure the municipality's capacity to service the loan and make repayments. Donors have also been successful in requiring co-financing before they provide their support for projects and programs. However, it is difficult if not impossible for donors to intervene on policy and budgeting changes in the partner country in return for their financial support. Thus, efforts to improve sustainability require the initiative and commitment of the partner country. To improve sustainability of PA financing in Bangladesh, three recommendations are offered related to budgeting and earmarks. These recommendations are presented below.

Establish budgeting levels for PAs on a 3 to 5 year cycle
To facilitate improved management and implement a financing strategy for protected areas, it is of critical importance to establish funding levels from budget resources on a multi-year timeframe. In part, this action is necessary because budget resources are one of the main mechanisms for supporting staffing and recurring costs. In addition, such action helps to increase the certainty in funding projections and signals the government's commitment to PA management.

Earmark existing and new revenue sources
Related to budget earmarks, it is also recommended to earmark existing and new revenues for PA management. At present, all revenues from protected areas (entrance and user fees, concession fees, fines for illegal harvesting) are deposited to the state treasury. Also, as we look at potential sources of revenue, it is important that any new sources be earmarked for protected area management. Otherwise, the incentive to develop new sources will be attenuated by the uncertainty that these resources will in fact be used for their intended purposes.

Redistribute or "equalize" earmarked revenue to support revenue-poor PAs
As noted earlier in this report, only a handful of protected areas in Bangladesh charge for entry and generate revenues from various user charges. For those protected areas that are more remote and less developed in terms of attractions, their revenue-earning potential is significantly less than the botanical gardens and safari and eco-parks. Thus, related to the recommendation to earmark PA revenues, it is proposed to develop a system to redistribute a portion of the revenues from the more popular parks to protected areas that generate less revenue. This system of redistribution would be similar to tax equalization schemes used in the U.S. to ensure that property tax poor counties are not disadvantaged in public school financing. The proposed scheme would allow parks to retain a portion of their revenues, based on operating costs, with the remainder diverted to a system-wide pool to be allocated according to funding needs and revenue levels.

4.4.3 INCREASE DOMESTIC SOURCES OF PA FINANCING

The major focus of fundraising for protected areas should focus on domestic sources. Such sources, in the long run, will be easier to sustain. In addition, there is simply to much uncertainty about the availability of international funding. Also, most of the long term funding needs for PAs will be recurring costs, for which international funding support is more limited. Beside the central budget resources recommended in the previous section, a number of recommendations for domestic financing are presented below.

Establish new earmarks based on water surcharges or other taxes and fees
In recognition of the range of vital services provided by protected areas, it is recommended to establish new earmarks for protected areas. The most appropriate source of funding for a new earmark would be a small surcharge on urban water users. This funding source has been used in several countries to support effective watershed and protected area management. The water surcharge can be very minimal and still generate considerable income, particularly in a country with the population of Bangladesh. Even a water charge of $.050 per connected household annually would generate several million dollars annually. Other possible surcharges such as adding an incremental charge to gasoline or energy charges also have the potential to generate substantial revenues although the link between the surtax and PA management is weak.

One option for introducing a water surcharge based earmark would be to first develop a pilot involving a medium-sized urban center that is near to a protected area and benefits from the protected area in terms of water production or flood mitigation. The pilot would be designed and evaluated before expanding the concept to the national level.

Increase revenues earned from PA activities and attractions
In our limited review of PA revenues, we have determined that there is considerable scope to increase these revenues. Some specific suggestions are as follow:

Entrance and user fees – these fees are very low and collected on a limited basis. We would recommend a system-wide analysis of both the potential for collecting entrance fees and the appropriate levels to charge. The study would also examine fees charged for lodging, picnicking, and other activities in protected areas.

Concession contracts – For the more popular parks, concession contracts provide an appropriate mechanism for the operation of services. However, concession contracts need to be structured to ensure that the Forest Department receives good value and to provide incentives for the concessionaire to increase revenues. The Forest Department should evaluate the management of rest houses and cabins through private concessions. Concessionaires would bring financial resources to this activity that would be useful for rehabilitating and improving the rest houses and cabins to increase their use and capacity for revenue generation. Also, the concessionaire would have greater incentive to market the rest houses and cabins to the public.

Confiscated timber – In our visit to Lawachara National Park, we observed the large number of confiscated logs in the yard in Srimangal. Apparently, the logs are stored at the Park until the court cases have been decided. The longer the logs remain in the yard, the lower will be their value if they are ultimately auctioned off. We would encourage the Forest Department to reassess the current policies for managing these confiscated logs. It might be more appropriate and beneficial to auction the logs immediately after they are confiscated rather than wait for the case to come to court. Obviously, a new policy would have to consider the possibility that the logger was not at fault and had been falsely accused. In these cases, the auction value would be forfeited to the accused.

Identify and prepare PA investment proposals for Arannayk Foundation support
The Forest Department and the WNCC has the opportunity to cooperate closely with the Arannayk Foundation to develop project ideas and utilize Foundation resources for gap financing. We understand that some discussions have already been held between the Forest Department and the Foundation and a few suggestions for cooperation have been explored including some financial support for FD field staff, visitor's centers, and developing architectural standards for buildings in protected areas.

Create "window" in Arannayk Foundation to receive and program private/corporate donations
At present, there is not a national NGO committed to protected area management support in Bangladesh. This makes it difficult to utilize donation mechanisms unless the Forest Department is able to earmark these donations for protected area management. However, there is scope for collecting donations at parks and protected areas, and raising money from donations at hotels and airports. One option for collecting and managing donation revenues would be to set up a window or special account to be managed by the Arannayk Foundation that is used explicitly for PA activities. Funding priorities for this donations account could be established by the Arannayk Board or a small committee of PA managers and NGOs.

Although donation programs are unlikely to raise large sums of money, they have the added benefit of drawing attention to the problems of protected areas. Typically, donation boxes or envelopes are provided at a location along with posters or brochures that describe the Pas and the threats that managers face in the protecting biodiversity and habitat in the protected areas. We would recommend a small study to explore opportunities for individual donations and corporate sponsorship (see next recommendation) be conducted to help the Forest Department develop these revenue sources.

Identify and develop opportunities for corporate sponsorship of PA activities and infrastructure

It appears that businesses in Bangladesh are interested in sponsoring activities or infrastructure development. We would recommend that a study be developed to explore corporate opportunities and incorporate these ideas into a corporate fundraising strategy. With the large increases in park visitation in recent years, corporate participation in activities that provide them with publicity and exposure to these visitors/consumers would be quite attractive. In other countries, corporations have participated in special groups such as 'friends of the protected areas" and helped with infrastructure financing and corporate fundraising. In addition, corporations often can be enticed to match private donations in special fundraising activities.

Identify community-level investment opportunities to complement co-management efforts

As noted in Section 4.3.5, microenterprise and infrastructure funds are already active in supporting pro-poor income generation and infrastructure projects. Also, there is no shortage of funds available for these activities. However, as the Forest Department implements the Nishorgo Program, it would be advantageous to engage in discussions with these funds to target some of their programs and resources on communities that will be most affected by the curtailing of extraction activities in protected areas.

4.4.4 INCREASE INTERNATIONAL SOURCES OF PA FINANCING

The initial and key message of this section is the need to demonstrate commitment and provide leverage to increase likelihood and level of support from international sources. All of the recommendations focus on mobilizing grant funds rather than the continued use of international credit for PA management support. The international options discussed below include fundraising from donors, NGOs, and foundations as well as the development of carbon sequestration options.

Rebuild and expand support from international donors and NGOS

As noted earlier, Bangladesh needs to move aggressively to rebuild interest and potential for support among donors and NGOs, particularly GEF, the bilateral donors, and international donors such as WWF. We believe that the recommendations presented in Section 4.4.1 are critically important in rebuilding international support among donors and NGOs. To complement these initiatives, it will also be important to approach international donor and NGO support as a leveraging strategy by demonstrating Bangladesh's willingness to co-finance initiatives for which they seek donor and NGO support.

Develop proposals for support from international foundations

The other potential international funding opportunity is the private non-profit foundations (many of which are in the US) that offer support for international projects. Most of these foundations have narrow thematic and geographical priorities and mainly support project expenditures as opposed to recurring costs or capitalization of endowments. Most promising themes for support would include biodiversity conservation, economic development support for women and ethnic groups, and pro-poor environmental health initiatives.

We would recommend a survey of international foundations be conducted to determine those that could potentially support PA management in Bangladesh, similar to the analysis conducted by IRG in Guatemala (discussed earlier). The study would generate a list of 15-30 foundations that might be approached to support PA and PA community projects. The study would also include recommendations on appropriate selection of applicants (e.g., local NGOs, Arannayk Foundation) and an action plan for developing and submitting proposals.

Develop a country-wide strategy for carbon sequestration

The final area of international support would be related to GCC initiatives mainly focused on carbon sequestration. Because of favorable growing conditions, Bangladesh has tremendous potential for sequestering carbon in its reserve forests and protected areas. We would recommend the development of a national strategy to identify potential carbon market and offset opportunities and identify policies for carrying out the required monitoring and verification of carbon sequestration commitments and for ensuring against illegal harvesting.

CHAPTER 5
THE ROLE OF PROTECTED AREAS IN ALLEVIATING POVERTY

In Chapter 2, we examined the economic value of protected areas, focusing on the services that can be provided by protected area ranging from provisioning to ecological services. The issue of potential conflict and competition between these services was noted but not fully developed in the context of the local communities which are affected by protected area designation and improved management of protected areas. As noted in Chapter 4, as the Forest Department strives to improve protected area management, these efforts will have an immediate impact on communities that have derived income, albeit from illegal activities, from the protected areas. Improved management of protected areas that restricts access to these areas may engender conflicts and social unrest in the surrounding communities.

In this chapter, we want to look at the challenges of promoting two seemingly conflicting goals simultaneously: (1) improved management of protected areas; and (2) alleviation of poverty in communities in and around protected areas. This challenge is recognized in the Poverty Reduction Strategy Paper (PRSP) which emphasizes the need for poverty reduction policies and strategies as well as community-based participatory management to reduce and/or rationalize the dependence of surrounding communities on protected areas (PRSP, 2005, p. 193).

To examine these goals and propose options for promoting both goals, we make use of a case study focusing on Lawachara National Park and the nearby communities. Lawachara is one of the Nishorgo Support Project's five implementation sites and has already been the subject of an assessment and a variety of implementation activities carried out by the project office in Sreemangal. The chapter is organized as follows: Section 5.1 and 5.2 describe Lawachara National Park and the surrounding communities, respectively; Section 5.3 assesses the current role of the Park in supporting livelihoods in the surrounding communities; and Section 5.4 presents options for addressing the goals of effective management of Lawachara and poverty alleviation in the surrounding communities.

5.1 LAWACHARA NATIONAL PARK

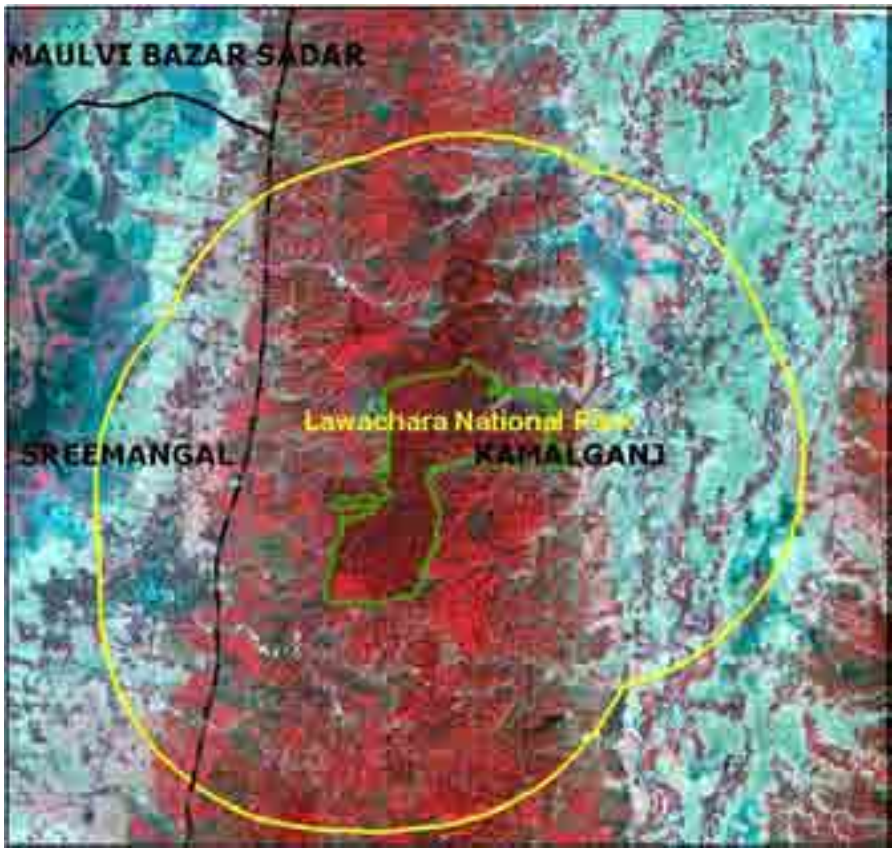
Lawachara National Park is a part of the West Bhanugach Reserved Forest within Lawachara, Chautali and Kalachara Beats of the Maulvibazar Range. The reserved forest was established through an order under the Forest Act. The national park was established more recently through a Gazette Notification (PBM (S-3) 7/96/367 on July 7, 1996) under the amended Wildlife Preservation Act of 1974. In addition to the area of 1250 hectare (ha) initially designated for the national park, an extension of 281 ha is proposed. The additional area would consolidate the remaining old (more than 25 years in age) plantations in West Bhanugach RF with the current National Park land to facilitate conservation of wildlife habitat, as recommended in the Forestry Master Plan (GOB, 1992).

The forest area in the National Park is undulating with scattered slopes and hillocks, locally called *tilla*, with an average elevation ranging from 10-50 meters. Numerous streams flow through the park. The forest is semi-/and mixed evergreen, where tall trees are deciduous and the understory is mainly evergreen. The forest originally supported an indigenous vegetation cover of mixed tropical evergreen forest. However, almost all of the original forest cover has been removed or substantially altered and the park can best be described as a secondary forest.

In Lawachara, the long rotation plantation species (teak, jarul, chapalish, garjan etc.) cover an area of about 1,110 ha and short rotation plantation species cover about 187 ha. Bamboo and cane plantation covers an additional area of about 25 ha and there are approximately 110 ha of a variety of tree species supporting betel vines. Ahsan (2000) and Feroz and Islam (2000) report that the tree density in Lawachara is 203 trees/ha for larger trees (greater than 10 dbh) and 271 trees/ha for smaller trees.

The existing information on the biological resources in the National Park is incomplete. There are approximately 167 plant species, four species of amphibians, six species of reptiles, 246 species of birds, and 20 animal species (Mollah et al., 2004). Lawachara is considered an attractive destination for birdwatching. Most of the large animals such as bear, leopard and deer are locally extinct and a number are locally endangered (small deer, gibbon, parrott, wild fowl, two species of turtles and the landoga snake (Mollah et al., 2004).

Protected Areas of Lawachara National Park



Part of the management challenge in Lawachara National Park is related to access and land use in the park and in the buffer areas surrounding the park. A road, rail line, and a gas line all pass through the park. There are two villages within the park's boundaries and numerous villages bordering or nearby. Some of the buffer areas include plantations that have been established under the FSP since 2002 on degraded or denuded reserve forest land, mainly in Kalachara and Chautali Beats of the Moulvibazar Range. The other major land use in the buffer areas outside the park are six tea plantations.

5.2 COMMUNITIES SURROUNDING LAWACHARA NATIONAL PARK

There are 18 villages in or near the park which have historically depended on Lawachara for timber, fuelwood, and non-timber forest products. Two villages – Magurchara punji and Lawachara punji – are situated within the park boundary. These villages are Khasia ethnic communities (the only in this region) and are highly dependent on the forest and the small agricultural plots they have been allotted for their livelihoods. The remaining villages are located outside the Park and can be differentiated in terms of their stake in Lawachara. The villages with a major stake in Lawachara include the two Khasia villages as well as Bagmara, Baligaon, Dolubari and Biranpur slum. Six villages have a moderate stake in Lawachara (Botertol slum, Rashtila, Saraibari, Veerachara, Chatokchara and Radhanagar) and the remaining six have a minor stake (Langurpur, Ballarpur, Noagaon, Tilagaon, Bhasaniganj and Bongaon). The total number of households in the surrounding villages of the Park is about 2113.

The largest village in the Park is **Magurchara punji**. It was established in early 1950s and presently consists of 40 households (HHs). The other village inside the Park is **Lawachara punji,** with 23 HHs (FSP 2000a and Chemonics 2002). The major activities and sources of income for these villages include betel leaf cultivation, rice cultivation, and fuelwood collection.. Villagers also collect various non-timber forest products (NTFPs) from the Park such as honey, bamboo, and lemon and pineapple. The other ethnic community (Tipra) in the vicinity of Lawachara is **Dolubari**, a settlement of 75 HHs at the hill foot flat at the south-west boundary of the park (FSP 2000a). About 70% of the HHs in Dolubari rely on cultivation of lemon and pineapples as their main source of income while the remaining HHs are employed as day laborers, engaged in agriculture or weaving. The rate of literacy among the three tribal communities is very low (20%). However, all village children attend primary school, although only 5-8% go to high school and only 5% study attend college.

The main sources of income for the villages outside the Park are quite diverse in nature. About 30% of HHs are engaged in fuelwood collection for their livelihood, another 30% HHs are engaged in agriculture, and about 30% are both farmer and forest products collectors (NTFPs). The remaining 10% are engaged in other occupations that include small business, employment in government and the private sector, and day labor (CNRS 2000).

The results of a survey on socioeconomic characteristics of villages in and surrounding Lawachara are presented in Table 5.1. The three household "wealth" characteristics presented in Table 5.1 include the value of household assets, land ownership and income. All of these characteristics provide a measure of current economic well-being and potential for growth.

Table 5.1: Socioeconomic Features of Villages Around Lawachara NP

Village	Total population	Average HH Size	Asset value	Annual HH Income	Avg. land holdings in Decimal	Per capita Land	Per capita Income
Baghmara	793	5.66	4290	33449.26	38	7	5905
Bongaon	496	6.44	8663	46947.37	12	2	7288
Boter tol	321	5.35	1780	33675.44	4	1	6294
Dolubari	385	4.81	10881	31397.26	9	2	6524
Doluchara-muslim para	291	5.39	21857	31133.33	33	6	5777
Hindu baligaon	480	5.52	5944	42183.91	103	19	7646
Ibrahimpur	304	5.24	350	16724.16	1	0	3191
Lawachara	117	5.09	21000	29347.83	300	59	5769
Longurpar	507	4.83	2056	25141.41	15	3	5207
Magurchara	418	5.50	No data	27027.13	300	55	4914
North Baligaon	516	5.16	2469	38284.50	40	8	7419
Radhanagar	723	4.92	14019	29295.14	49	10	5956
Rajtila	979	5.97	4669	34648.47	58	10	5804
Satakchara	522	5.61	7901	40513.33	6	1	7218
Sorai bari	805	6.34	8036	39041.67	8	1	6159
South Baligaon	1476	5.59	6060	42644.86	11	2	7628
Tila gaon	273	5.06	3108	18283.87	20	4	3617
Vasanigaon	525	5.25	3703	20793.88	23	4	3961
Verachara	820	6.61	9207	42195.12	6	1	6381
West Baligaon	90	4.50	2395	26330.00	21	5	5851

Source: Household-level data collected by RDRS for 20 villages near Lawachara, 2005

The results of the survey indicate that these villages are extremely poor, lack household assets to offer as collateral for loans, have very limited landholdings which can be used to increase agricultural earnings and earn incomes for below national averages for per capita income. With the exception of Lawachara and Maguracharа, which were granted three acres (300 decimels) per household by the Forest Department more than 40 years ago, most villages have less than one acre per household and several have less than 1/10th of an acre per household. This means that most households have only enough land for their dwelling.

The analysis of per-capita income showed that it varies from Tk 3191 to Tk 7646 (about 120 USD). Even at the high end, the per capita income level for Lawachara villages is only slightly more than 1/4th the national average of $440/capita. The per capital income, family size, per capital landholdings clearly revealed that the inhabitants of 20 villages can be considered as extremely poor. To provide more texture to the discussion of Lawachara communities, the box below summarizes our discussions with individuals in two of the communities.

Summary of Discussions in Magurchara punji and Baghmara

Magurchara punji – Households in this village are relatively well off in comparison to other Lawachara villages. Each HH is allocated 3 acres for betel leaf cultivation that enables HHs to earn subsistence income between Tk 5000-6000. Women are engaged in betel leaf sorting and processing activities, manage the households and infrequently collect firewood. About 90% of the villagers have a primary education, but secondary and higher education poses logistic problems and reduces the HH work force because of the time commitment. There is little perceived need or scope for other technical training for skill development. In the village, there is a communal semi *pacca* latrine, a good water supply facility with no arsenic problem, and REB electricity connections. The village has a small amount of arable land for rice and vegetable cultivation and raises animals for meat. There is ample fuelwood available for cooking as electricity is relatively quite expensive. As their Montry (community leader - Mr. Gitison Pradhan Suchiang) indicated, the village is not extremely poor and has ample food for three daily meals. They have augmented their income from betel leaf with a compensation package from Unicol following the Magurchara gas fire. The village's infrastructure is of poor quality but adequate. Road and trail construction and maintenance is the responsibility of all HHs as is the security system they maintain to guard their crops and property.

Baghmara – This village is situated at the foot of the hill of Lawachara NP and includes about 300 households. A different level of living is observed here in comparison to Magurchara. The majority of the villagers do not have arable land and the small amount of land for the homestead is not well managed for supplementary income generation. Although the average per capita income is higher than in Magurchara, most families have incomes in the range of Tk 2000-2500 mostly from illegal felling and fuelwood collection. About 170 families encroached on a large tract of forest land of the Park and converted it to agriculture. The hillside of Lawachara NP visible from the village has been completely denuded. Many of the young adults in the village participate in illegal felling during night time. Literacy rates are very low even though young children attend primary school. Infrastructure in the village is of poor quality with roads inadequate for motorized vehicles, poor sanitation services, and no electricity (even though there is REB connectivity with a half kilometer of the village). Malnutrition appears to be pervasive and the community is prone to water-borne diseases due to poor quality of sanitation and water services.

5.3 CURRENT ROLE OF LAWACHARA NATIONAL PARK IN SUPPORTING COMMUNITIES

There is a strong linkage between poverty and conservation of natural resources, which is a mutually reinforcing process. The tribal communities living in forests, communities of landless and migrant workers living in the buffer zone areas of PAs, depend on natural resources for their subsistence and livelihood. On the one hand poverty forced the poor to "mine" natural capital for survival beyond the sustainable limit and this leads to depletion and degradation of the resource base and deterioration of the quality of life. On the other hand, overexploitation of nature also implies decline in the *per capita* quantity and/or quality of water, land, forest, and biodiversity, which aggravates poverty. Thus conservation and regeneration of natural resources through appropriate intervention and investment have to be ensured so that the poor and vulnerable communities can depend upon the natural resources on a sustainable basis (PRSP, 2005, pg. 5.446). The major causes responsible for forest depletion in Bangladesh as identified in the PRSP are:

- Lack of a conservation approach;
- Low priority attached to biodiversity conservation;
- Encroachment from outsiders;
- Inadequate participation of people and civil society in management;
- Lack of law and order and inadequate legal supports;
- Corruption and pressure from the local elites;
- Poor management and administration;
- Lack of proper monitoring and accountability; and

- Absence of incentives for Forest Department employees.

In this section, we focus attention mainly on the forest extraction in Lawachara, the level of participation of local communities in extraction activities and the importance of extraction activities to livelihoods of the communities surrounding Lawachara National Park. Most of the analysis presented below is drawn from the NSP's Site-Level Field Appraisal of Lawachara (Mollah et al., 2004).

The site-level field appraisal identified twelve different types of resources that are currently extracted from Lawachara and assessed the level of extraction and impact on management of the park. The two major concerns are fuelwood and timber, both of which are extracted on a major scale. Three resources have been extracted at moderate scale: bamboo, house construction materials,and sungrass. The remaining resource types are extracted on a minor or negligible scale. We focus the discussion below mainly on the fuelwood and timber extraction which pose the greatest threat to the park's forest cover and biodiversity habitat and are the most important source of income for surrounding communities. In addition, the clearing of forested areas impacts on shrubs, herb plants, and grasses that depend on the tree canopy for their survival. Mollah et al. report that even though forest coverage in Lawachara has only declined by 15%, the abundance of these shrubs, plants, and grasses has declined by 80%. Table 5.2 provides a summary of the moderate and minor extractive activities in Lawachara.

Table 5.2: Extraction Activities in Lawachara (Excludes Timber and Fuelwood)

Bamboo	Used for house construction, fencing, baskets and handicrafts. Bamboo is used to meet HH needs and to supplement HH income. About 2-3% of the HHs are completely or partially dependent on bamboo collection. As a result of widespread extraction wild varieties are heavily depleted and most harvesting is of plantation varieties. There is a local commercial market for bamboo and it is also transported to Singair bill, Azampur, Mukundopur, Akhaura, Kosba, Imambari, and Dhirai from Vanugach bazaar.
Wildlife	Local people hunt wildlife for consumption as well as hobby. Some outside people also hunt birds and fowl and there is serious depletion of stock.
Vegetables	There is a large variety of vegetablse available in Lawachara NP. These include bamboo shoots (manthana), bankach (bandhugi), ramkala, thankuni, aorai kalai, karam, palong shak, and kachu lati. Extraction has minimum impact and provides nutritional value to the rural communities that needs to be promoted in the communities through awareness raising.
Fruit	Local people collect citrus and pineapple for HH consumption and in some cases for selling in the local markets. Mostly women and children are engaged in this activity.
Betel leaf cultivation	Forest villagers grow betel vines on mature trees. To improve the production of betel leaf, the traditional cultivation practice requires lopping of the braches of the trees each year and weeding of the areas. This cultivation practices destroy biodiversity and wildlife habitat.
Fish	Fishes, like puti, latia agor, Aku (shrimp) are collected from streams inside the NP, mainly by the two villages inside the park's boundaries.

Timber

Timber harvesting in Lawachara has fluctuated widely over the last few decades. Prior to liberation, harvesting was limited then increased during and immediately after liberation. Harvesting slowed in the 1980s and early 1990s, then began to accelerate in the last few years. These fluctuations are in part due to policies but also to growing cycles and to demand for timber. The illegal harvesting of teak trees in particular has increased dramatically in the last few years:

	2000-2001	2001-2002	2002-2003	2003-2004	Jul-Oct 2004
# of Teak trees felled*	32	125	514	1,062	609
Average cubic feet of Teak lost**	336	1,312	5,397	11,151	9,394

* Source: Offense Register of Forest Department, Lawachara Beat

** Source: Calculated from Offense Register data, average girth and volume table provided by Forest Department

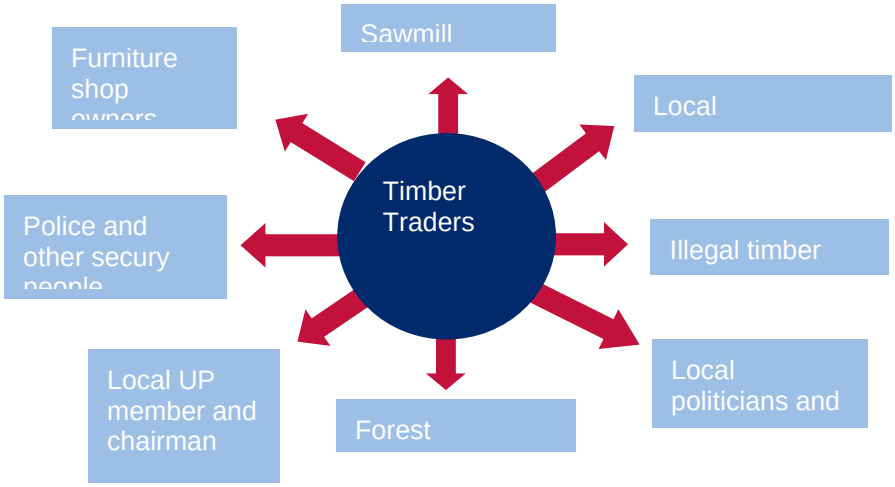
There is considerable demand for timber from Lawachara from the sawmills, furniture shops, traders, and local people:

There are 9 sawmills in Bhanugach-Kamalgonj and 12 in Srimongal)

There are a large number of local furniture shops including about 30 in Bhanugach bazaar

There are about 10-12 timber traders (*mhalders*) in Srimongal and 15-20 timber traders at Bhanugach bazar who are associated with timber trading activities near Lawachara NP.

Many of the timber traders have legal licenses to engage in trading and bid at FD auctions. As shown in the figure below, timber traders are a central focus of the timber distribution system with links to local elites, local administration police, forest staffs, sawmill owners and furniture shops. The traders also are closely linked with the trade in illegal timber. In the illegal market, traders can purchase timber at significantly discounted prices (Tk 250-300 per cubic foot) compared prices of Tk 500-600 per cubic foot in competitive auctions.



Link of various stakeholders with Timber traders (Mollah *et al.*, 2004)

Illegal timber harvesting in Lawachara is carried out by 8-10 organized groups (referred to as syndicates) consisting of 20 to 25 members in each group. The syndicates are controlled by local elites and timber traders, brick kilns owners, politicians, police and forest staffs. Because of the risks of being caught, the syndicates pay villagers to cut the trees and pay them between Tk 200 and 300 per day to participate in the felling and removal activities. Unemployed workers from the tea estates are often engaged in illegal extraction, removing the logs through the Bharaura, Jakchara and Gilachara tea estates to Srimangal (Mollah *et al.,* 2004). Table 5.3 provides an overview of who is believed to be involved in the illegal timber extraction activities from the surrounding villages.

Table 5.3: Illegal Felling of Timber from Lawachara NP

Village	Total number of HHs	Who is involved						Use	
		Male	Female	Children	Poor	Wealthy	Local people	Domestic use	Selling
Birainpur	300	12	-	-	-	-	100%	-	100%
Radhanagar	325	20			-		100%	-	100%
Bagmara	300	120	40	12	85%	15%	100%	-	100%
Rashtila	171	25	-	-	100%	-	100%	-	100%
Chatokchara	61	30	-	-	-	-	100%	-	100%
Baligaon	300	35	-	-	80%	20%-	100%	-	100%
Verachara	118	25	-	-	100%	-	100%	-	100%
Langurpar	92	12	-	-	100%	-	100%	-	100%
Ballarpar	61	15	-	-	-	-	100%	-	100%
Vasanigaon	-	14	-	-	-	-	100%	-	100%
Tilagaon	-	10	-	-	-	-	100%	-	100%
Noagaon	-	14	-	-	-	-	100%	-	100%
Botertol	-	13	-	-	-	-	100%	-	100%

Source: Site-Level Field Appraisal for Protected Area Co-management: LNP, Mollah *et al.,* 2004 p. 56

Fuelwood

Fuelwood is collected on a continuous basis with higher collection intensity during the dry season. The main source of demand is for cooking. Villagers involved in fuelwood collection do so to meet their own household needs and to supplement incomes by selling fuelwood to local buyers including households, tea stalls, restaurants, and local brick kilns. As with timber, there is also an active group of fuelwood traders including about 14 fuelwood traders in Vanugach and Srimongal. Traders purchase fuelwood at a price of Tk. 50-60 per maund (approximately 37.5 kg) from collectors and sell fuelwood in the market for Tk 65-75.

About 80% of HHs in the villages surrounding Lawachara is engaged in fuelwood collection. It is estimated that 7-10% of HHs are entirely dependent on fuelwood collection for their livelihood. **Table 5.4** describes the participation of selected villages in fuelwood collection

Table 5.4: Participation in Fuelwood Collection

Village	Total Number of HHs	Who collects fuelwood				Use	
		Male	Female	Children	Poor	Domestic use	Selling for income
Birainpur	300		110	-	100%	30%	70%
Dolubari (Tiprpara)	72	16	20	-	100%	100%	-
Bagmara	300	50	100	120	70%	80%	20%
Rashtila	171	-	30	25	100%	75%	25%
Chatokchara	61		12	10	100%	60%	40%-
Baligaon	300	-	-	-	-	-	-
Lawachara punji	23	10	11	-	100%	100%	-
Magurchara Punji	40	20	20	-	90%	100%	-

Source: Site-Level Field Appraisal for Protected Area Co-management: LNP, Mollah *et al.,* 2004 p. 53

5.4 MANAGING LAWACHARA NATIONAL PARK TO ALLEVIATE POVERTY

This section will look at the dual challenges of effectively managing the Lawachara National Park while addressing the poverty issues that the surrounding communities currently face and at least transitionally, will be exacerbated by reduced income earning from illegal harvesting and gathering of fuelwood in the park.

The Forest Department has undertaken efforts to develop a management plan for Lawachara National Park. The park is also the focus of efforts by NSP to introduce co-management arrangements to foster cooperation between the local managers of the park and the surrounding communities. NSP is also helping to make improvements in the park and has produced signs to display in the park and helped the Forest Department develop new hiking trails and signposts to help guide visitors. We acknowledge the efforts of the Forest Department and NSP to improve management of Lawachara National Park and take as our starting point that more effective management practices will be in place in the near future. However, it is beyond the scope of our task to assess the collaborative efforts of the Forest Department and NSP. Instead, the discussion in this section will focus on the implications of effective management on the surrounding communities and options for addressing the poverty issues for surrounding communities.

5.4.1 IMPACTS OF IMPROVED MANAGEMENT ON LOCAL COMMUNITIES

The most obvious immediate impact of improved management is to reduce the harvesting of biomass from the forests by local communities. In analyzing these impacts, it is useful to distinguish timber harvesting from collection of fuelwood and building materials such as bamboo.

Timber

As has been noted in Mollah et al. (2004), much of the illegal timber harvesting in Lawachara is organized by local elites with communities mainly involved in the cutting and transport of illegally felled trees in return for rather modest compensation (in comparison to the market value of the timber and the revenue earned by the organizers of these activities). With the illegal harvesting proceeding at a rate far in excess of sustainable yields (if in fact, the park was managed as a productive forest rather than a protected area), Lawachara would soon meet the same fate as protected areas in the south that have been virtually denuded of large trees.

The main point is that the income that communities are earning from timber felling is not "sustainable." Absent improved management, the value of timber felling to local communities in terms of income would decline as the number of trees available for harvesting declines. Thus, while the immediate impact of reducing illegal felling appears to be substantial, certainly in comparison to current HH income levels, this impact declines within the next decade. On the other hand, as management efforts curtail illegal harvesting and the number and size of large trees increases, the pressure and perceived incentives for illegal felling will also increase. Those willing to take their chances and participate in the timber gangs will probably receive high compensation for the more risky activity. Thus, as long as there is poverty in the communities, the improved management will simply increase the harvest value of the forest and incentives for illegal activities.

Fuelwood and non-timber harvesting

Management controls that reduce collection of fuelwood and other non-timber forest products will have a much wider impact on the communities surrounding Lawachara because of the much higher participation rates in these activities. As noted earlier, a small share of HHs (certainly less than 10%) rely on fuelwood collection as their only/primary source of income. Most of the other HHs engaged in fuelwood collection do so to meet HH needs for cooking and to supplement HH income.

Improved management of the Park and reduction of fuelwood collection will reduce the supply of fuelwood in the local market and likely result in higher prices. Thus, communities would be affected in two ways: 1) reduced incomes from the sale of fuelwood; 2) increased HH expenditures on fuelwood, reducing disposable income that can be utilized for other HH purposes.

The impact of improved management of the Park on fuelwood collection is one that comes with a potential silver lining. The use of fuelwood for cooking, particularly in the confined unventilated kitchens that are typical in these communities has a major health impact. In South Asia, health effects associated with indoor air pollution is one of the two major sources of morbidity and mortality (the other are illnesses associated with poor water quality and sanitation practices). Thus, if (and this is a big if) alternative sources of cooking fuel are developed to replace the diminished supply of fuelwood, the health benefits would partially offset the lost inome for communities.

Reductions in non-timber harvesting other than fuelwood will also have impacts on local communities, albeit of a lower magnitude. In part, there are more substitutes for the non-timber products using in building and crafts.

5.4.2 OPTIONS FOR ALLEVIATING POVERTY IN THE SURROUNDING COMMUNITIES

In assessing options for poverty alleviation, it is useful to take a holistic approach that looks both at opportunities for increasing incomes as well as developing human capacities in the communities. In other words, by strengthening human capacity, communities are better positioned to take advantage of income generating opportunities. Human capacity building includes attention to the following:

Improving the health of community members

In our visit to the two communities in the vicinity of Lawachara, we observed three main areas where the health of the villagers needs to be addressed. First, access to clean healthy water needs to be improved. We noted that such cost-effective water production methods such as rainwater harvesting are not being utilized in the villages but that water is drawn from surface sources. Given the amount of rainfall in the region, the villages could produce enough water by harvesting rain water and developing storage capacity. By developing rainwater, the community not only has a source of cleaner water, but also invests less time in water gathering. Second, sanitary facilities need to be improved. When combined with availability of clean water, there is scope for improved hygiene as well.

We would recommend that grant resources be identified to carry out a pilot rainwater harvesting and sanitation project in one of the communities. Such a pilot would demonstrate both the potential and cost-effectiveness of rainwater harvesting. World Vision in Bangladesh established a rainwater harvesting system for 8-10 families in Dubwora upazila (subdistrict), Garo hill under Mymnesingh district for about Tk 50,000. The State of West Bengal has considerable experience in rainwater harvesting and could provide useful information on system design, construction and management. By combining rainwater harvesting with improved sanitation, it possible to substantially increase the health benefits of improved water access, encourage improved hygiene and reduce time requirements in water collection.

Third, alternatives to fuelwood and biomass cooking are needed. The use of traditional stoves and biomass fuels energy make the kitchen environment serious and hazardous. According to the Asian Least Cost Gas Abatement Strategy (ALGAS) report for Bangladesh, 80 percent of households use simple traditional stoves. Women, in particular are exposed to high level of indoor air pollution. One study showed that fuelwood in open fire stoves emits 100 to 180 grams carbon monoxide and 7.7 grams of particulate matter per kg of firewood (Ellegard and Egneus, 1992). One kg charcoal used for cooking in metal stoves emits 250 to 380 grams of carbon monoxide, but less (2.8 g) particulate matter (FAO, Role of Wood Energy in Asia, 1997). Exposure to these pollutants are made worse by poor ventilation in rural houses. The potential solutions to the indoor air pollution include: a) improved stoves both in terms of efficiency and ventilation; and b) conversion to alternative heating sources such as propane or electricity (if available). Both of these alternatives, however, require new appliances and are likely to be more costly. It is recommended that both of the options for reducing indoor air pollution be studied in greater detail and practical cost-effective options be explored. As noted earlier, this option would also reduce the pressure on Lawachara fuelwood resources.

Education and vocational training

Improvement in the rural education system is a long term process. School facilities and staff have to be improved and better transportation services are required to ensure that students will attend high schools that are located outside of the villages. Probably the two most difficult challenges in improving literacy rates and encouraging children to stay in school are to reduce the household's dependence on the labor of the children and creating job opportunities that require basic competency in reading, writing, and numbers. As long as the expectation of households is that children will work in agriculture, there will be limited incentive to stay in school beyond the minimal required duration. Some suggested options for improving educational opportunities include:

Extending better educational opportunities, including expanding free education for girls by establishing more girl's school preferably through community management (focus of PRSP and MDGs)

Expanding education under mass literacy program of the Ministry of Primary Education (focus of PRSP and MDGs)

Vocational training is also needed to enable communities to take advantage of alternative income generation opportunities. Given the low literacy rates in the villages, vocational programs need to be carefully designed, relying heaviliy on hands-on instruction.

Increasing time for labor outside the household
Child care is the primary responsibility of all parents and is one of the key factors that discourage labor outside of the household. Community-operated day care can provide one option for increasing the time available to pursue outside labor opportunities. In addition, other factors can reduce the amount of labor required to carry out HH functions. In addition to better water supplies, electrification, telecommunications, improved roads and transportation, and closer proximity to markets will also help to increase the time available for outside labor.

All of the capacity building issues above help to prepare communities to take advantage of income generating opportunities. Infrastructure improvements are particularly important in developing business opportunities that are not based on natural resources. Opportunities for income generation can be divided into those related to natural resources and those related to rural business. Natural resource income opportunities can be further subdivided into three categories: 1) those related directly to Lawachara National Park; 2) those related to the buffer zones; and 3) those related to the privately owned lands in the surrounding communities.

Lawachara National Park
The National Park provides a variety of income opportunities for surrounding communities. First, there are the income/revenue opportunities associated with co-management and participation in activities such a park patrols. The co-management option is under development as part of the NSP. The roles and responsibilities of the Lawachara Co-Management Committee are elaborated in a draft memorandum of understanding between the Forest Department and the committee. In terms of direct compensation, the co-management arrangement calls for the committee to receive grant monies for community-based projects. As noted previously, NSP has also developed a small revolving fund (the Landscape Development Fund) to assist community members in developing business opportunities. The other potential source of income for the communities in return for their participation in co-management concerns the possibility for the co-management committee to negotiate with the Forest Department to have access to resources in the buffer zone (discussed bleow).

Second, there is the potential for communities to benefit from the Park by providing tourism services for visitors to the park. As management improves and visitation increases, there may be opportunities for communities to provide tourism services based on the natural, agricultural, and cultural resources in the area, provide accommodations, food services, and merchandise to visitors. The Forest Department will need to improve marketing of the Park and more aggressively pursue potential visitor groups such as schools and foreign eco-tourists.

Third, the Park could potentially participate in carbon markets and generate income from maintaining the forest timber stock. If Bangladesh pursues carbon sequestration options, it is recommended that the surrounding communities share this revenue as they will play an important role in ensuring that the trees are not illegally harvested (a breach of the carbon contracts).

Fourth, the management plan for the Park needs to evaluate and clearly elaborate the scope of sustainable harvesting activities that will be permitted. Some fuelwood collection can be sustained as a result of dead trees, fallen branches, and regular clearing of roads and trails. In addition, collection of non-timber products can be carried out provided these activities to not adversely impact on the park. In comparison to the current level of illegal harvesting, the potential income from these extractive activities will be low but not insignificant.

Buffer Zones
The buffer zones provide an alternative source of timber, fuelwood, bamboo, and other products for surrounding communities. Under the Social Forestry Program, user groups formed of 15-25 participants from neighboring villages are involved in raising, protecting and managing plantations on reserved forests adjacent to the Park. The user groups as a whole have been assigned forest land for which they sign Participatory Benefits Sharing Agreements (PBSAs) (valid for a rotation period of 10 years) with the Forest Departments. An average of 1 hectare of land has been allocated to each participant. This program allows the participants to share in the revenues when the plantation trees are harvested.

As the Social Forestry Program does not cover all of the land in the buffer zone, there may be additional opportunities to develop income in other parts of the buffer zone. We recommend that the management plan for the Park also address the potential utilization options for the buffer zone. To the extent that the buffer zone can meet some or all of the resource or income needs of communities, extraction pressure on the Park's resources will be reduced.

Community Agricultural Lands
While virtually all available arable land in the surrounding communities is utilized in agricultural production, there may be opportunities to increase the incomes earned in agriculture through diversification and expansion into high valued agricultural crops and horticulture and by expanding livestock operations.

Agricultural and Horticultural Crops. The following production practices can be popularized and promoted through training and motivation:

- Integrated homestead farming by engaging women and family members for self employment
- Cultivation of high value crops for rice cultivation and horticulture practices.
- Village tree nursery by engaging local NGOs for training and demonstrating;
- Food processing and marketing for local consumption and marketing these outside their locality like other districts and capital city.

Livestock Rearing. Livestock-poultry sub-sector is an important part of the agriculture sector and cattle rearing with focus on milk and cow rearing is particularly suitable for poor people residing within and outside the Park. The following livestock rearing practices are found suitable for their implementation in and around the PA :

- Beef fattening
- Milk cow rearing
- Broiler/Layer rearing

Fisheries. The following production technologies were identified for the fishery sector towards income poverty reduction:

- Rice fish farming
- Fingerling rearing
- Carp polyculture
- Fish culture

Rural Business

The final area of income generation relates to rural business development. The keys to rural enterprise development are an understanding of business start-up, management and financial planning, access to start-up capital, skills to produce or market the services or products of the enterprise, and knowledge of current and potential demand. Communities surrounding Lawachara will require training and information to exploit enterprise development opportunities. Bangladesh has a vibrant microenterprise sector and short-term credit is available from MFIs as well as the NSP's Landscape Development Fund.

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