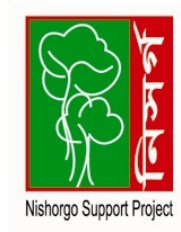




**NISHORGO SUPPORT PROJECT  
AND  
FORESTRY SECTOR PROJECT**

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# **NISHORGO SUPPORT PROJECT AND FORESTRY SECTOR PROJECT**

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With Partners : CODEC, NACOM & RDRS



## TABLE OF CONTENTS

<b>1. INTRODUCTION</b> .....	4
1.1 Background.....	4
1.2 Objectives of Forestry Sector Project.....	5
1.3 Objectives of Nishorgo Support Project.....	5
1.4 Protected Areas covered under NSP and FSP.....	6
1.5 Biodiversity Conservation Values.....	7
1.6 Protected Area Boundaries.....	8
1.7 Biophysical Situation.....	9
1.8 Protected Area Habitats.....	10
<b>2. ESTABLISHING LINKAGES BETWEEN NSP AND FSP</b> .....	12
2.1 Conservation Area Management Activities under FSP.....	12
2.2 Buffer Zone Plantations around Lawachara National Park.....	12
2.3 Buffer Zone Plantations around Rema-Kalenga Wildlife Sanctuary.....	14
2.4 Buffer Zone Plantations in Teknaf Game Reserve.....	15
<b>3. RECOMMENDATIONS</b> .....	18

## 1. INTRODUCTION

Nishorgo Support Project (NSP) is being implemented in 5 Pilot Sites (Lawachara National Park, Rema-Kelenga Wildlife Sanctuary, proposed Satchuri National Park, Chunoti Wildlife Sanctuary and Teknaf Game Reserve). The Asian Development Bank (ADB) funded Forestry Sector Project (FSP) was designed to be implemented in 7 Protected Areas (Lawachara National Park, Rema-Kalenga Wildlife Sanctuary, Chunoti Wildlife Sanctuary, Teknaf Game Reserve, Himchari National Park, Hazarikhil Wildlife Sanctuary and Madhupur National Park). However, field activities could not be taken up in Chunoti Wildlife Sanctuary as it was transferred from Chittagong (South) Forest Division to Chittagong Wildlife Wildlife Management and Nature Conservation Division, which was not included in the Project Proforma of FSP. So only 3 PAs (Lawachara National Park, Rema-Kalenga Wildlife Sanctuary and Teknaf Game Reserve) are common where the planned management interventions are being carried out under both the projects currently under implementation.

It is thought necessary to first describe (in Section 1) the notified areas of the 3 common PAs (oftenly referred to as core areas) in order to establish appropriate linkages between the NSP and FSP. Appropriate linkages between the two projects are then discussed in Section 2 in order to catalyze synergy for biodiversity conservation in the 3 common PAs. Finally important recommendations have been made in Section 3 based on plausible field experiences and discussions with key stakeholders, NSP staff and FD officials including the Project Director, FSP and the concerned DFOs.

### 1.1 Background

Participatory forestry projects, supported by donors, have been implemented in Bangladesh on a large scale since 1981 when a community forestry project was taken up by Forest Department (FD) with the financial support from ADB. The Forestry Master Plan, completed in 1993 with the assistance from ADB, led to the promulgation of the people-oriented Forest Policy of 1994. Sectoral forestry development projects such as FSP (1997/98 – 2005/6) are being implemented with a major policy shift in favor of a participatory management of forests and protected areas wherein local people and communities participate in developing, protecting and managing forests/plantations in lieu of usufructury rights. The FSP is being implemented based on the experiences generated during the course of implementation of the ADB supported Community Forestry Project (CFP) and Upzila Afforestation Nursery Development Project (UANDP), which focused mainly on raising participatory plantations. Indeed the FSP is the first donor funded project that included an important component on natural forests management including PAs.

The NSP (2003/4 – 2007/8) is a project of the FD, Ministry of Environment & Forest, funded by USAID and implemented by International Resources Group (IRG). The project is supporting a broad Nishorgo Program of FD, which is a comprehensive effort to improve the management of country's PAs. At the heart of Nishorgo Program is a focus on building gainful partnerships between the FD and key local, regional and national stakeholders, who can assist in the conservation efforts for PAs. An effective implementation of the Nishorgo Program will help conserve biodiversity through facility development, capacity building, and gainful partnerships with stakeholders. Under its partnership with the Government of Bangladesh, the USAID

Bangladesh is providing targeted technical support to main aspects of the Nishorgo Program. The NSP works closely with the FD and key conservation stakeholders to develop and implement a co-management strategy to help conserve the country's PAs where relevant partnerships for biodiversity conservation are essential. The Project is working at five initial pilot sites (Lawachara National Park, Rema-Kelinga Wildlife Sanctuary, proposed Satchuri National Park, Chunoti Wildlife Sanctuary and Teknaf Game Reserve), of which the first 3 PAs are in Sylhet Forest Division and 1 PA in Chittagong (South) Forest Division (recently transferred to Chittagong Wildlife and Nature Conservation Division) and 1 PA in Cox's Bazar (South) Forest Division.

## **1.2 Objectives of Forestry Sector Project**

Main objectives of the FSP are to :

- Enhance the conservation of forests in selected project areas, increase overall wood production and institute sustainable management of forest resources through local community participation, institutional capacity building and policy reform;
- Continue the expansion and extension of the successful models of participatory afforestation and rehabilitation of degraded forests and other under-utilized government lands;
- Enhance the capacity of FD and NGOs, delivery mechanisms and the appreciation of the local environment;
- Institutionalize community participation in forest management, thereby increasing overall wood production and contributing to forest conservation; and
- Ensure conservation and sustainability of forest resources, leading to better environment both for the present and future generations.

The above-mentioned objectives are being achieved by implementing three programs on i) afforestation, ii) natural forest management and iii) support activities by following a participatory approach of forestry sector development. Unlike other ADB funded projects (e.g. CFP, UANDP, etc.) FSP for the first time included a component on the protection, management and development of natural forests under the control and management of FD. Under natural forest management program a component on conservation area management was included with main aim of the management of 7 PAs by focusing to retain maximum possible under forest cover, and to maintain this forest in the best possible condition based on a participatory approach of PA management. Three sub-components under conservation area management are i) management of existing PAs, ii) expansion of PAs and iii) buffer zone management in association with local communities.

## **1.3 Objectives of Nishorgo Support Project**

The NSP is designed to assist FD in achievement of the primary objective of conservation of biodiversity within the PAs of Bangladesh. This overall objective is to be achieved through support to the FD and key stakeholders in protecting, rehabilitating, conserving and sustainably managing biodiversity of the PAs by building partnerships based on shared rights and responsibilities. Rural development efforts have so far either been inadequate or failed to take

into account relevant linkages between conservation of PAs and welfare of local people. Not only they are getting less production and employment opportunities due to decreasing land fertility and reduced underground water tables but also degraded forests are not able to meet their bonafide consumption needs for forest produce. The consequent degradation of both public and private land-based resources has resulted in widespread deprivation and rural poverty among local people. A gainful association of such rural mass, achieved by establishing partnership mechanisms, is essential for sustainable management of the country's PAs. Co-management agreements are formal mechanisms for soliciting community interventions for the protection and conservation of PAs in lieu of identified benefits.

Collaborative management – or co-management - is defined as a situation in which two or more social actors negotiate, define and guarantee amongst themselves a fair sharing of the management functions, entitlements and responsibilities for a given territory, area or set of natural resources. An equitable sharing of benefits and costs of PAs' protection and management among the stakeholders is, therefore, an important part of co-management approach. An effective linking of socio-economic and ecological incentives and biodiversity conservation will be instrumental in eliciting stakeholders' participation in this approach. For Bangladesh's PAs, relevant co-management actors will include the FD, as legal custodian of PAs, and the stakeholders that play important role in the conservation management. Co-management agreements are important for linking participatory benefit sharing arrangements to PA conservation and will help formalize symbiotic linkages.

Main objectives of NSP are summarized as below :

- Develop a functional model for formalized co-management of PAs;
- Create alternative income generation opportunities for key local stakeholders;
- Develop policies conducive to improved PA management and build constituencies to further these goals;
- Strengthen the institutional systems and capacity of the FD and key stakeholders;
- Develop infrastructure facilities within PAs; and
- Restore and manage habitats.

#### ***1.4 Protected Areas covered under NSP and FSP***

Of the 3 PAs covered under both NSP and FSP, 2 are located in Sylhet Forest Division of north-eastern Bangladesh whereas one PA is located in south-eastern Bangladesh (in Cox's Bazar South Forest Division). These PAs have been an intimate interspersed of human habitations and cultivation through them with traditional dependency on neighbouring forests for their livelihood in a largely agrarian economy. In addition to development pressures on forest land, the traditional dependence of local communities on forests has historically been an important aspect of forests management in Bangladesh. As a result, the biodiversity conservation priorities could not be set in isolation from local forest resource use and development. Anthropogenic pressures including increased commercial extraction of forest produce, and forest land encroachment for habitations and agriculture, brought by manifold increase in human and cattle population, led to shrinkage and degradation of the PAs. Illegal removals from the forests have increased off late, thereby jeopardizing the very existence of biodiversity in the PAs. This has adversely affected

the local people and communities as well as the conservation status of wildlife habitat. The livelihood of the natural resources dependent people is affected adversely.

Bangladesh Railway serves well as both the PAs in north fall near to the main railway line running through Sylhet forest division. Due to their well connectivity (through road and railways), the northern PAs are very attractive for eco-tourism and biodiversity, particularly for the people of large urban centers such as Dhaka. They are well connected by the national highway, which also provides easy access to the nearest national/international airport at Sylhet. Teknaf Game Reserve is well connected mainly by road but also by air as Cox's Bazar has an airport. Lawachara NP (in Kamalganj Upzila of Maulvibazar District) is located nearly 160 km northeast of Dhaka and approximately 60 km south of Sylhet city. It lies between 24030' – 24032' N and 91037' – 91047' E and is nearly eight km east of Srimongal, on way to Kamalganj. The NP comprises forests of southern and eastern parts of West Bhanugach Reserve Forest (RF) within Lawachara, Chautali and Kalachara Beats of Maulvibazar Range. The NP was notified in 1996 as per the Wildlife (Preservation) (Amendment) Act, 1974, with a total forest area of 1250 ha.

Rema-Kalenga WS (in Chunarughat and Madhabpur Upazilas of Habiganj District) is located nearly 130 km east-northeast of Dhaka and approximately 80 km south-southwest of Sylhet city. The Sanctuary lies in between 24006' – 24014' N and between 91036' – 91039' E. The WS, bordering on east and south by the Indian state of Tripura, comprises forests of southern and eastern parts of Tarap Hill RF covering Kalenga, Chonbari and Rema Beats of Habiganj-2 Range. The WS was originally notified in 1981 with a total forest area of 1095 ha, and expanded to 1795 ha in 1996, and now includes nearly 85% of the high forest remaining in Tarap Hill RF. Parts of Tarap Hill RF are contiguous with the Sanctuary's western and northern boundaries.

Teknaf Game Reserve (GR), as a part of Teknaf peninsula, is located in the country's far south-eastern corner, near to Myanmar border. It was established in 1983 over a RF area of 11,615 ha covering 11 forest blocks in three Forest Ranges (Whykong, Silkhali and Teknaf) of Cox's Bazar (South) Forest Division. It is situated in Ukhia and Teknaf Upzilas of Cox's Bazar District, and lies in between the Naf river on eastern side and Bay of Bengal on western side. The GR is part of a linear hill range (reaching an altitude of 700m) gently slopping to rugged hills and cliffs running down the central part of the peninsula, with a north-south length of nearly 28 km and an east-west width of 3-5 km). A number of deep gullies and narrow valleys are crossed by numerous streams flowing down to Naf river in east and Bay of Bengal in west. Most of the streams are seasonal and dry up during off-monsoon season. The northern boundary of the GR starts near Whykong town (which is nearly 50 km from Cox's Bazar), extending in south up to Teknaf town. A metalled road connecting Cox's Bazar with Teknaf runs in between the Naf river and eastern boundary of the GR. Although a four wheel drive can reach Teknaf on western side through an unbroken stretch of beach from Cox's Bazar during low tide, no metalled road exist presently. Many earthen and brick soled roads traverse the GR from east to west including one on the north most boundary.

## **1.5 Biodiversity Conservation Values**

The forests of all the 3 PAs are very rich biologically, located as they are on the high rainfall biogeographic zone with evergreen and semi-evergreen forests. The PAs represent several features of the bio-diversity of north-eastern subcontinent, which is one of the mega biodiversity region

with many floral endemic species. Many important rivers flow through the region comprising the PAs, forming fertile floodplains with enhanced economic activity and high population density. The PAs are home to many tribes with their traditional lifestyle dependent on natural resources including forests for their forests-based livelihood. Many Forest Villages were historically established within the RFs, now part of the PAs, in order to ensure a regular labor supply for forestry activities including harvest of natural forests followed by raising plantations. These forests play an important role in regulating water flows and checking soil erosion. Indeed the conservation of the PAs is very important as their forests form important catchments and were so designated historically as head water reserves for many rivers and numerous water bodies. They are part of transnational watersheds with intense forests-water interactions that have regional implications. In addition to providing a sanctuary to wildlife, these forests also may in future form water sanctuaries required for the conservation of water and soil, and in carbon sequestration. The protection and conservation of these forests is particularly important in view of significant loss of natural forests in the country.

Socio-economic values of the 3 PAs are important because a number of communities including ethnic minorities reside within and around the forests on which they depend for their livelihood opportunities. Biological values of the 3 PAs include providing shelter to biodiversity comprising important flora and fauna, habitat connectivity, presence of threatened and endemic species, and improvement of degrading habitat. Their main ecological functions are catchment conservation of several rivers and water bodies (*haors, beels, ponds, etc.*), control of soil erosion, ecological security, irrigation and agricultural production, carbon sink and environmental amelioration. They provide significant scope for wildlife education and research, nature interpretation and conservation awareness due to their rich biodiversity, which if not conserved, may be lost for future generations. These PAs are also a potential source of eco-tourism, aesthetic values, dense high forests, historical and cultural values, scenic beauty and ethnic diversity. Finally many conservation values of these PAs are global, regional and national but also with local socio-economic implications.

## **1.6 Protected Area Boundaries**

Lawachara National Park is part of West Bhanugach RF, which was reserved in early nineteenth century by following the reservation process per the Forest Act 1878, the Assam Forest Manual 1898 and the Forest Act 1927. The settlements claims of local communities were settled and legal boundaries identified with names of forest blocks, compartments, etc. Working Plans were prepared with topographical maps (1 inch to 1 mile or 1 : 63,360) and specific recommendations for the maintenance of legal boundaries of forest blocks and compartments were given. The boundaries of forests could not, however, be maintained, as a result of which some forest areas have been brought under encroachment for cultivation and settlements. Although the Park was notified by the Government in 1996, no efforts have so far been made to physically demarcate the boundaries in the field. The situation got exacerbated with heavy biotic pressure on forests and encroachment of forest land. As a result, the forests have become fragmented with reduced extent of suitable habitats and ensuing adverse effects on wildlife. This has adversely affected the ecological boundaries of Lawachara Park with limited wildlife corridors and breeding space.

Rema-Kalenga WS is part of Tarap Hill RF, which was reserved in early nineteenth century when the settlements claims of local communities were settled and legal boundaries identified with names of forest blocks, compartments, etc. Working Plans were prepared with



topographical maps (1 inch to 1 mile or 1 : 63,360) and specific recommendations for the maintenance of legal boundaries of forest blocks and compartments were given. As in case of Lawachara the boundaries of forests could not, however, be maintained. Although the WS was notified by the Government, no efforts have been made to physically demarcate the boundaries in the field. The forests have become fragmented with reduced extent of suitable habitats and ensuing adverse effects on wildlife. This has adversely affected the ecological boundaries of the Sanctuary with limited wildlife corridors and breeding space.

Teknaf GR as a part of Teknaf peninsula covers 11 forest blocks, which were covered under regular working plans for their management. Separate management plans for Teknaf GR were prepared under Forest Resources Management Project and Forestry Sector Project. But many recommendations of the plans including boundary demarcation and maintenance could not be implemented due mainly to paucity of funds. As a result, neither physical boundary signs are available presently nor effective steps have been taken for checking forest land encroachment, particularly for agriculture including betel leaf cultivation.

## **1.7 Biophysical Situation**

The low and rolling hills (of upper tertiary rocks) of the PAs are composed of upper tertiary rocks in which soft sandstone supports a vegetation cover of mixed tropical evergreen and semi-evergreen forests. The region has been formed from the sediments brought down by rivers draining from neighbouring hills. A series of isolated low and high hills, derived from sandstones and shales, and interspersed with narrow floodplains of small rivers, are found in the PAs. They represent north-eastern hills, interspersed with north-eastern piedmont plains. The soils can be categorized as hill brown sandy loams with slight to strong acidity. They are shallow over sandstone bedrocks on high hills and accumulation of humus on the top of soil is small due mainly to rapid decomposition of debris under moist warm tropical conditions. The well drained sandy loam soil with good humus are present but near nullahs and streams the soils are sandy; in swampy areas forest soils are clayey.

The PAs originally supported mixed tropical evergreen and semi-evergreen forests, which over the period have been substantially altered due to heavy biotic interference and the plantations of exotic species established after clear-felling of natural vegetation. Encroachments of forests has resulted in conversion of many low lying areas into paddy cultivation. As a result, the habitat has fragmented, adversely affecting the wildlife by restricting their movements through a barrier effect. However, at places good natural re-growth, particularly of ground flora and middle storey in northern PAs, has come up due to favorable climatic and edaphic conditions, thereby enhancing the PA's *in-situ* conservation values. Old plantations raised particularly in the northern sites have grown up in shape of tall multi-storied structure with re-growth of ground flora and a middle storey of naturally occurring species. Consequently the vegetation at many places particularly in the northern PAs has approached towards natural structure and species.

The climate of the PAs is in general warm and humid but the weather is cool and pleasant during winter; the humidity is high throughout the year. There is heavy dew during winter when rainfall is low. The water condensation is thus distributed throughout the year in different forms and greatly influences plants and wildlife. The area covered under the PAs is one of the wettest in the country and so the rainfall is quite high, with maximum rainfall falling during June to September from South-West monsoon. Pre-monsoon Nor'westerly and cyclonic storms are

accompanied by high speed winds and rains, which do considerable damage to property and trees. In the absence of adequate steep gradient required to carry huge monsoon rainfall, the water gets collected in depressions, locally known as *haors* and *beels*. The water recedes during dry season, enabling local people to cultivate the remainder land with winter crops. The level of swamps is, however, being raised gradually due to siltation.

There are a number of rivers (and their tributaries), and shallow depressions (e.g. *haors*), which are wetlands providing marshy sanctuaries to migratory birds and livelihood to local fishermen. They provide good habitat, drainage and drinking water source for the wild animals and local people. The rivers possess main characteristics of a flat alluvial country as the current is sluggish, the course tortuous and the bottom muddy. The waters are surcharged with materials brought from surrounding hills during monsoon rains and a large portion of the silt is deposited in the immediate neighbourhood of the streams. A number of sandy-bedded streams and nallahs pass through the PAs and so aquatic habitats associated with forest cover and riparian (streamside) vegetation and animal species are important part of overall habitat composition. Many of these streams are subjected to intense collection of sand during dry season for commercial sale. The PAs form the catchment areas of a number of small streams, locally known as *cheras*.

## **1.8 Protected Area Habitats**

The forests of the PAs are composed of mixed tropical evergreen and semi-evergreen plant species, characterized by high rainfall and a multi-tier vegetational assemblage of rich biodiversity. Therefore, the PAs are categorized under the tropical evergreen and semi-evergreen biogeographic zone. The influence of microclimatic and edaphic factors including rainfall, humidity, aspect, sunshine and soil is predominant on these forests. Five broad types of habitats in the PAs can be identified as i) high forests represented by the remaining natural forests, ii) plantations including the monoculture of exotics, iii) grasslands and bamboos, iv) wetlands, and v) cultivated fields; the first two being the largest in extent and also important from PA management point of view. The cultivated fields (mainly of paddy) and grasslands, which harbour some mammals, ground birds and reptiles, get inundated during monsoon rains. The water bodies harbour important fish species, water birds and amphibians.

Presently all the 3 PAs have some natural forests, and the plantations raised earlier by converting high forests of great biodiversity value. Large deciduous trees are mixed with evergreen smaller trees and bamboos. The top canopy, particularly in northern PAs, includes *Artocarpus chaplasha*, *Dipterocarpus turbinatus*, *Elaeocarpus floribundaas*, *Dillenia pentagyna*, *Castanopsis tribuloides*, etc. The shrub species comprise of *Adhatoda zeylanica*, *Carea arborea* and others, whereas bamboos species are *Bambusa tulda*, *Bambusa polymorpha*, *Bambusa longispiculata*, etc, and Saccharum, Daemonorops, Thysanolaena as main grass species. A number of fodder and fruit bearing plants occur naturally but forest fires in summer and illicit felling have adversely affected their natural forest regeneration.

Major parts of natural forests of the PAs were converted by raising long rotation plantations (of teak, mahogany, garjan, karai, sal, gamari, shiso, toon, pynkado, agar, jarul, cham, jam, etc) taken up since 1920s for production forestry. Parts of the original forests have been removed and the PAs' conservation value currently stems from the remaining natural forests and the plantations, which have developed a tall, multi-storied structure particularly in northern PAs.

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The PAs represent accessible hill forests, and so their biodiversity conservation and eco-tourism values need to be recognized. Although plantations occupy substantial part, a portion of the PAs still have some natural forests, where the under-storey of shrubs, herbs and bamboo is good. The enrichment plantations of indigeneous tree species and under-planting of bamboo and cane has been taken up in some areas. In the oldest of these areas the vegetation cover has taken on the structure of natural forest particularly in northern PAs.

Initially these forests were managed, and rightly so, under selection-cum-improvement silvicultural system as the natural regeneration of main species was good and the terrain was generally hilly. Unfortunately they were subsequently opened for clearfelling followed by artificial regeneration by planting species such as garjan, champ, bonak, karai, jam, gamar, sal, teak, jam, kumbi, haritiki, bohera, dhakijam, hargoza, jarul, kadam, malakana, gamar, rata and gondrai (the first plantations were taken up in 1922 as documented in Working Plans). Teak plantations have been particularly subject to illicit felling by local people but also by outsiders due to high value teak timber. Similarly NTFPs such as cane and creepers are illegally harvested and some wildlife damage also done by hunting.

A number of animal species (mammals, birds, reptiles and amphibians), both forest-dwelling and wetland-associated species, of different genera and families are found in the 4 PAs that also are home to avifauna of many species (representing a substantial portion of the country's known bird species) dependent on good undergrowth and forest cover. Some of the forest-dwelling and wetland-associated species are at high risk of extinction. The PAs support herpetofauna, including frogs, toads, turtles, lizards, snakes and a rich diversity of other faunal groups such as invertebrates and fishes. Many large mammals such as tigers, leopards, bears, wild dogs and sambar have disappeared from the PAs due to habitat degradation and hunting. However, elephants still use both Chunoti and Teknaf as movement corridors. The viable populations of many small and medium-sized mammal species that can survive in limited forest areas and/or disturbed or secondary habitats (e.g., jackals, small cats, barking deer, wild pigs, etc.) are found in the remaining disturbed and fragmented habitat. A rich diversity of other faunal groups such as reptiles, vertebrates, fishes and amphibians is present.

## **2. ESTABLISHING LINKAGES BETWEEN NSP AND FSP**

The natural forest management program of FSP includes the conservation area management component focusing on participatory management of 7 PAs. This component offers ample opportunities for establishing close linkages between the ongoing activities of FSP and the planned activities under NSP.

### ***2.1 Conservation Area Management Activities under FSP***

In this Section appropriate linkages are established between NSP and FSP for each of the 3 PAs common to both the projects. The conservation area management component under FSP has the following three sub-components : i) management of existing PAs, ii) expansion of PAs and iii) buffer zone management in association with local communities. The existing notified area of the 7 PAs was to be managed under the first sub-component of FSP. An amount of Tk. 96.21 million was earmarked for covering an area of 24,150 ha with management aim of long-term biological restoration through natural regeneration, habitat rehabilitation and protection from biotic interference. Under the second sub-component new areas of outstanding beauty and attractions and with ecological and biological importance were to be identified and notified as PAs. An amount of Tk. 1.4 million was earmarked for bringing an additional 2,000 ha forests under PA cover. The third sub-component to be implemented in identified buffer zones around the PAs focused on participatory management by associating local stakeholders through usufructury benefits granted to them based on participatory benefits sharing agreements (PBSAs). The user groups of participants, formed with the help of locally selected NGOs, enter into agreements with FD for raising and managing plantations on sustainable use basis in identified buffer areas in order to reduce biotic pressure on PA's core areas. An amount of Tk. 166.21 million was earmarked for covering an area of 5,160 ha under buffer zone activities including buffer zone plantations.

Unfortunately not much could be implemented under the conservation area component till 2001-02 due to a number of reasons. Even after 2002 main activities under this component were implemented under the third subcomponent focusing on buffer areas mainly for raising buffer zone plantations. For instance, during 2002-03 and 2003-04 only buffer zone plantations (mainly woodlots and agroforestry) were raised over an area of 1,277 ha and 2,080 ha respectively in the PAs covered under FSP. In view of poor implementation, particularly on the sub-component i) and ii), a review mission (2004) of ADB has substantially curtailed the budget earmarked for these two sub-components. As a result, only buffer zone plantations under buffer zone management, and to much lesser extent enrichment plantations (planned during 2004-05 – a target of 900 ha enrichment plantations has been fixed for Cox's Bazar South Division for implementation in Teknaf Game Reserve and Himchari National Park) under the sub-component i) on existing areas, are being implemented currently.

### ***2.2 Buffer Zone Plantations around Lawachara National Park***

The Park is intimately surrounded by a number of villages, towns, cultivated fields and Tea Estates. It is bordered on the north, west, south and south-east largely by Tea Estates whereas a

part of the eastern boundary (nearly 1 km.) is bordered by FD lands (mainly grasslands) under long-term lease to HEED Bangladesh (a health and participatory development NGO). Most of the north-eastern boundary of the Park is bordered by FD lands under Kalachara Beat. Local population including ethnic minorities, who depend on agriculture for their livelihood, meet their consumption needs for forest produce from nearby forests. The area used for betel leaf production by the residents of Lawachara Forest Village is an enclave within a larger area used by BFRI for silvicultural research. The boundary between the Park and the BFRI area is nearly 2 km. in length.

In total 18 villages of local stakeholders, identified in and around the Park's boundaries, will form key local stakeholders for an effective Park management. These villages lie within 1 km. of the Park boundary; 4 villages (Baligaon, Bagmara, Rashtila and Chatakchara) are just at the outskirts of the Park. Of the 18 villages, 6 villages (Bagmara, Magurchara, Lawachara, Baligaon, Dolubari and Biranpur slum) have been identified as having major stakes, another 6 villages (Botertol slum, Rashtila, Saraibari, Veerachara and Radhanagar) with moderate level of stakes and the remaining 6 villages (Langurpur, Ballarpur, Noagaon, Tilagaon, Bhasaniganj and Bongaon) with minor level of stakes in the forests covered under the Park. Local people from Lawachara, Magurchara, Dolubari and Birainpur are involved mainly in fuelwood collection, whereas people from Baghmara, Radhanagar, Rashtila, Baligaon, Verachara and Chatakchara are involved in illicit felling as well. Two recognized Forest Villages, Magurchara Punji (40 households) and Lawachara Punji (23 households) inhabited by khasia ethnic minority and now located within the core zone, were established by FD in 1950s under an agreement signed between the FD and the representatives of the tribal community. Three acres of forest land was assigned to each household (presently a household has 8-10 family members) for the practice of betel leaf cultivation and in turn they provided voluntary labor required for FD activities including nursery, plantations and protection of forests. They continue to practice betel leaf cultivation for which they plant betel cuttings near trees and start harvesting betel leaves after three years upto 25-30 years.

Buffer zone plantations are being established under FSP since 2002 on RF land, available around Lawachara NP, mainly in Kalachara and Chautali Beats of Moulvibazar Range. The year-wise buffer planting details in each of the Beats are presented in Table 2.2 :

**Table 2.2 Buffer Zone Plantations around Lawachara National Park**

Year	Range	Beat	Plantation (ha)
2002-3	Moulvibazar	Kalachara	70
2003-4	Moulvibazar	Kalachara	80
		Chautali	25
2004-5	Moulvibazar	Kalachara	43

Source : DFO, Sylhet Forest Division

These buffer zone plantations are mainly woodlots of fast growing tree species (including indigeneous species) planted at a spacing of 2 m x 2 m (2500 seedlings/ha). The main objectives of raising buffer plantations are to plant degraded/barren forest lands with suitable/indigeneous tree species by associating local stakeholders on usufruct sharing basis and reforest encroached and blank forest lands to reduce biotic pressure on core areas. The user groups formed of 15-25

participants from neighbouring villages are involved in raising, protecting and managing these plantations raised on RF land adjacent to the core area of Lawachara NP. The user groups as a whole have been assigned forest land for which they sign PBSAs (valid for a rotation period of 10 years) with the FD.

The forest land for raising buffer plantations are assigned to a user group in such a way that each participant's share would on an average be 1 ha. In lieu of their protection efforts the user groups are entitled for sharing benefits as per the PBSAs (in case of woodlot and agroforestry plantations the participants are entitled to 45% of the total proceeds from the harvest whereas the FD gets 45% and the remainder 10% is deposited in a Tree Farming Fund to be operated by user groups). The woodlots are harvested at 10 years rotation with two intermittent thinning at year 4 and year 7. The forest produce from the first thinning entirely goes to user group whereas the proceeds from 2<sup>nd</sup> thinning and final harvest are shared as per the PBSA. Other intermediate benefits arising from cleaning/pruning, agricultural crops raised till canopy closure, fruit trees along the boundaries, etc. entirely go to the participants/user groups.

### ***2.3 Buffer Zone Plantations around Rema-Kalenga Wildlife Sanctuary***

A number of villages, cultivated fields, tea estates, khas lands and forests are located around Rema-Kalenga WS. The WS is intimately surrounded by a number of villages, cultivated fields, forests and Tea Estates. It is bordered along most of its northern and western boundaries by RFs (nearly 11.5 km in length), along part of its south-western boundary by Tea Estate lands (nearly 3.5 km in length), along its southern and eastern boundaries by India (nearly 15 km), and along a small portion of its northern boundary by khas lands (approximately 1 km in length). Little or no natural forest borders the Sanctuary on the east or south, although some scrub vegetation remains. Land adjacent to the Sanctuary in India has been converted to rubber plantations and paddy fields. A contingent of the Bangladesh Rifles (BDR) is responsible for maintaining security along the Bangladesh-Indian Border (bordering Indian state of Tripura), which forms the eastern and southern boundaries of the Rema-Kalenga Sanctuary. BDR has established two camps in the area, one adjacent to the Kalenga Beat Office and one in the interior of the Sanctuary along the southern boundary. The presence of substantial staff of BDR brings additional biotic pressure on one hand but on the other hand helps check illicit felling from the forests.

Based on a RRA/PRA study conducted by NACOM during May-July 2004, a total of 22 villages have been identified having stakes of different levels in the WS. Of these, Debrabari Forest Village is located inside the WS, 9 villages (Kalengabari, Kalibari, Mongoliabari, Puranbari, Chakidarbari, Chanbari, Rema-Balumara, Hatimara and Krishnachara) are on the periphery of WS, and 12 villages (Harinmara, Himalia, Chamaltoli, Nichintapur, Lalkear, Barabda, Sayadabaj, Alinagar, Krishnanagar, Basulla, Kabilashpur and Jamburachara) are located outside of the WS. Ten villages inside and on the periphery of WS have major stakes in the WS as local villagers depend on the WS for meeting their basic consumption needs. In addition to fuelwood, timber, bamboo and other NTFPs, they collect vegetables, fruits, fodder and sungrass from the WS. The collected vegetables include bamboo shoots (manthana), dhekishak, kachshak, bandhugi, banaita, banana thor, banana muchhi, ramkala, thankuni, aorai kalai, karam, gantha, muia, palon shak, kachu, kachur lati, etc. The forest fruits collected by them include kow, jam, hill mango, lata mango, chamkatahal, latkon, dumur, hill banana, amra, hortuki, boira, tera, jambura, kanthal, cane fruits, etc. For consumption they also hunt jungle fowl, wild boar, hill

moyna, parrots, shalik, etc. Tipra tribals from Debrabari Forest Village get involved in forest protection efforts by joining patrol parties of FD. The remaining 12 villages lying outside the WS have minor stakes mainly in terms of associated with fuelwood collection. A number of Tripura villages/housing clusters (for example, Chonbari, Mongoliabari, Kaliabari, Krishnachara, together comprising 60 or more households) are scattered (from Chonbari Beat Office to near the Indian Border) along the north-western and northern boundaries of the Sanctuary.

Under FSP the buffer zone plantations are being established on RF land around Rema-Kalenga Wildlife Sanctuary since 2002. The year-wise planting details in each of the Beats are as below :

**Table 2.3 Buffer Zone Plantations around Rema-Kalenga Wildlife Sanctaury**

Year	Range	Beat	Plantation (ha)
2002-3	Habiganj 2	Chonbari	30
2003-4	Habiganj 2	Kalenga	150
2004-5	Habiganj 2	Kalenga	43

Source : DFO, Sylhet

The technical details of the above-mentioned buffer plantations are the same as in Section 2.2. Local people practice cultivation of paddy on rainfed fields and horticulture on their home gardens. They depend heavily on nearby forests for meeting their subsistence consumption needs. The settlements in the vicinity of the Sanctuary include Kalenga Office Tila (comprising 57 Bengalee households) near to the Kalenga Beat Office and Hizmalia (comprising nearly 200 households) at the western edge of the RF near Kalenga Beat Office. Local people are involved in paddy farming, small scale trading and as daily laborers. They also use nearby forests for fuelwood, timber and cultivation on encroached forest lands (nearly 400 families were evicted from the RF areas in 1982).

## **2.4 Buffer Zone Plantations in Teknaf Game Reserve**

A large number of villages/paras, cultivated fields including betel leaf areas, khas lands, brick fields, prawn farms and water bodies are located in and around Teknaf Game Reserve. It is bordered along most of its northern boundaries by RF, along southern boundary by Teknaf town including BDR establishments, along its western boundary by Bay of Bengal and along eastern boundary by Naf river bordering Myanmar. As a result of refugee influx from Myanmar, a number of Rohingya camps and settlements have come up in between the Naf river and the eastern boundary of GR. A large number of betel leaf cultivation areas are noticed, particularly in and around the western boundary facing the Bay of Bengal. Local people cultivate betel leaf as a cash crop for which they collect forest materials such as bamboo, leaves, grass and small trees from the GR for erecting fences around their betel leaf fields, providing support to betel vines and also for roof construction for shade. On encroached forest lands they burn forest floor for the preparation of betel vine beds and also weed eradication. A part of land adjacent to the eastern boundary of the GR along the Bay of Bengal has been converted to prawn farms. Little or no natural forest borders the GR on the west, although some scrub vegetation remains. Bangladesh Rifles (BDR) is responsible for maintaining security along the Bangladesh-Myanmar

Border. The presence of BDR staff brings additional biotic pressure on one hand but on the other hand may help check illicit felling from the forests.

Based on a RRA/PRA study conducted by NACOM during May-July 2004, a total of 115 settlements locally called paras or villages (spread over 6 unions : Zaliapalong, Whykong, Baharachara, Hnilla, Sabrang and Teknaf) have been identified having stakes of different levels in the GR. A total of 53 settlements are located inside the GR boundaries whereas the remainder 62 paras are situated (adjacent or outside the GR) in the interface landscape zone. Nearly two-third of total paras (the villages inside and on the periphery of WS) have major stakes in the WS as local villagers depend on the GR for meeting their basic consumption needs. In addition to fuelwood, timber, bamboo and other NTFPs, they collect vegetables, fruits, fodder and sungrass from the GR. They collect vegetables and fruits, and also hunt wild birds, etc. The remaining one-third paras (lying mainly outside the GR) have minor stakes mainly in terms of associated with fuelwood collection. There are a number of tribal settlements (Tonchonga mainly in Shilkhali, Monkhal and Roikhong; and Rakhain-also known as Mogh- mainly in Hnilla and Whykong, etc.). Most of them are poor and get engaged as agricultural labourers, fuelwood collectors, fisherman, jhum cultivators, weavers, etc. The Rohingas (refugees from Mynamar) are located mainly at Jahajpura, Shamlapur and Teknaf. Only two settlements (Noyapara Camp 1 and 2) of Rohingas are legally recognized by the Government.

Buffer zone plantations are being established on RF land in Teknaf Game Reserve since 2002. The year-wise planting details in each of the Beats are as below :

**Table 2.4 Buffer Zone Plantations in Teknaf Game Reserve**

Year	Range	Beat	Plantation (ha)
2002-3	Teknaf	Teknaf	25
		Hnilla	10
2003-4	Whykhyong	Roikhong	60
		Teknaf	30
		Mochuni	60
		Hnilla	40
	Shilkhali	Moidho Hnilla	60
		Shilkhali	50
		Mathavanga	20
		Rajarchara	50
2004-5	Targets (Ranges/Beats to be decided)		50

Source : DFO, Cox's Bazar (South) Forest Division

The technical details of the above-mentioned buffer plantations are the same as stated in Section 2.2. As per the PRA report nearly 70% of local people are very poor, followed by poor as 19% and the remainder as middle class. Nearly 80% of local people are landless but have homestead land on which they cultivate a variety of fruit trees. Some practice cultivation of paddy on rainfed fields and betel leaf cultivation on encroached land. They depend heavily on nearby forests for meeting their subsistence consumption needs; per the PRA report about 90% of total households depend on forests for meeting their fuelwood needs. Local people are involved in paddy farming, small scale trading and as daily laborers. Agriculture is the main income source



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of 53% of households, followed by fishing and shrimp collection (30%), day labourers (10%) and others (7%). On the western side of the GR facing Bay of Bengal most of the local people depend on fish collection and betel leaf cultivation, whereas on the eastern side facing the Naf river most of the local people depend on agriculture and forests. They also use nearby forests for fuelwood, timber and cultivation on encroached forest lands. An exploitative relationship of

this large population with nearby forests has contributed to habitat degradation including lack of natural regeneration due mainly to forest land encroachment, wide spread unemployment and rural poverty, weak law enforcement, illegal felling for timber and fuelwood, refugee settlements, betel leaf cultivation, brickfields, jhum, etc.

### 3. RECOMMENDATIONS

The importance of establishing close linkages required for catalyzing synergy between the two people-centered projects is being increasingly realized both by FD officials and the staff of NSP. As discussed in Section 2 the buffer zone plantations being raised under FSP in fact fall under the interface landscape zones as identified under NSP. The user groups of participants to whom forest land is assigned for raising, protecting and managing buffer zone plantations are indeed from the villages located in the identified interface zones. An important objective of raising buffer zone plantations through peoples' participation is to reduce biotic pressure on core areas. During the field visits it became evident that this message has not percolated down well to local villagers due mainly to low importance given to building public awareness under FSP. The NSP staff can bridge this gap through better motivation, training and communication activities on biodiversity conservation in the 3 common PAs.

The planned activities under NSP will be implemented by new user groups being formed by NSP field staff. This gives an opportunity for the NSP staff to forge close linkages between NSP and FSP through formation and motivation of user groups. There can be many ways to establish such linkages. For example, the chairman and some other members of the user groups of FSP can be opted as members of user groups being formed under NSP. This also means that whenever the NSP field staff visits a village having FSP user groups they should invariably discuss with the group members about biodiversity conservation activities including their responsibility of providing protection to core areas around which they are engaged in buffer zone plantation activities. Also there can be a case for the formation of a network or federation in relation to the user groups formed under the two projects. The skill development, training and income generation activities planned under NSP should also include the group members active under FSP. Similarly a close coordination can be achieved by FD whenever the field staff interacts with the two user groups. This issue has been discussed with the officials FSP directorate and FD field staff, who agree to maintain close linkages between the two projects through the user groups. The planned co-management committees to be chaired by the concerned ACF/DFO should also focus such coordination issues during their regular meetings.