SIMPLIFIED MANAGEMENT GUIDELINES : REMA-KALENGA WILDLIFE SANCTUARY

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The simplified management guidelines have been developed based on the five year management plan for Rema-Kalenga Wildlife Sanctuary (WS) being presently managed under Nishorgo Support Project (NSP). The NSP is supporting a broad Nishorgo Program of Forest Department (FD), which is a comprehensive effort to improve the management of country's protected areas (PAs). At the heart of Nishorgo Program is a focus on building equitable partnerships between the FD and key local, regional and national stakeholders, who can assist in conservation efforts for Rema-Kalenga WS. An effective implementation of the Nishorgo Program will help conserve biodiversity through protection of forests and wildlife, facility development, capacity building, and gainful partnerships with stakeholders. The Plan provides for an overall five year framework for developing and managing the Sanctuary. Main focus of forest management under this Plan is on the conservation of forests and constituent biodiversity resources, sustainable use of specified areas where this can help to achieve conservation on a broader scale, and involvement of local people and other key stakeholders in the Sanctuary management.

Main long-term management aim is to maintain the maximum possible area under forest cover, and to maintain this forest and its constituent biodiversity in the best possible condition. Main objectives of the Plan are as follows :

- To develop and implement a co-management approach that will ensure long-term protection and conservation of biodiversity within the WS, while permitting sustainable use in designated zones by local people as key stakeholders
- To conserve the biodiversity of the WS based on building partnerships with all the stakeholders and sharing benefits with local communities and key stakeholders
- To refine and strengthen the policy, operational, infrastructural and institutional capacity framework for Sanctuary management
- To implement income generation activities for sustainable livelihood development and skill development among the local stakeholders so as to make contribution in rural poverty alleviation.
- To conserve and maintain viable wildlife population
- To restore and maintain as far as possible the floral, faunal, physical attributes and productivity of the forest eco-systems, and enhance private nursery development and tree growing activities.
- To encourage eco-tourism in suitable zones and develop visitor amenities

I. Assessment of the Present Situation

The Plan has adopted a landscape approach of Sanctuary management by addressing the needs of surrounding households and co-management activities in the context of a broader economic, natural resource and socio-institutional environment. A number of villages, cultivated fields, tea estates, *khas* lands, forests and international border fall within the zone of influence of Rema-Kalenga WS. The Sanctuary 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, along part of its south-western boundary by Rema Tea Estate lands, along its southern and eastern boundaries by the Indian state of Tripura, and along a small portion of its northern boundary by *khas* lands (Figure 1). A total of 22 villages have stakes but only one Forest Village (Debrabari) is located within the Sanctuary. Most of the labourers living on Rema Tea Estates exert enormous biotic pressure on the nearby forests and wildlife of the Sanctuary. Some workers get involved in illicit felling from the WS and they transport the forest produce through the Tea Estates. Hoogli (east of the WS but near to Tarap Hill RF) and Purkul (north-west of the WS) though not adjoining to the WS are other important Tea Estates. Khas lands adjacent to the Sanctuary have been partially converted to citrus and banana plantations.

The Sanctuary (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 WS and its

proposed interface landscape zone (a 5 km-wide strip bordering the Sanctuary on the west and north), bordering on east and south by the Indian state of Tripura, comprises the forests of southern and eastern parts of Tarap Hill RF covering Kalenga, Chonbari and Rema Beats of Habiganj-2 Range. It was originally notified in 1981 with a total forest area of 1095 ha, and expanded to 1795 ha in 1996. Six broad ecosystem types in the WS and its interface landscape are identified as below :

i) forests represented by the remaining natural forests,
ii) plantations including the monoculture of exotics,
iii) grasslands and bamboos,
iv) wetlands/waterbodies,
v) tea estates, and
vi) cultivated fields, homesteads and fruit tree gardens

The WS comprises the remaining natural forests (mainly mixed tropical evergreen and semi-evergreen 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 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 in the WS. Natural forests were converted by raising long rotation plantations (of teak, mahogany, cane, garjan, karoi, sal, gamari, shisoo, toon, pynkado, agar, jarul, cham, jam, etc) taken up in Rema-Kalenga from 1930s for production forestry.

A number of animal species of different genera and families are found in the WS; a total of 167 species including forest-dwelling and wetland-associated species. Of 35 mammal species documented in the area at least 23 species are at a high risk of extinction. Rema-Kalenga also supports an important herpetofauna, including 7 frogs and toads, 2 turtles, 6 lizards, and 10 snakes among the total 25 species documented to date. The Sanctuary also supports a rich diversity of other faunal groups such as invertebrates and fishes. Large mammals such as bears, wild dogs and sambar have disappeared from the WS due to habitat degradation and hunting. However, 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. A good population of capped langurs and macaques is found in the WS. A number of sandy-bedded streams and *nallahs* pass through the WS and so aquatic habitats associated with forest cover and riparian (streamside) vegetation and animal species are important part of overall habitat composition.

II. Recommendations for Strategic Programs

1. HABITAT PROTECTION PROGRAMS

Heavy biotic pressure brought by manifold increase in population, and agricultural and industrial demands have resulted in habitat degradation and consequent loss of wildlife in the Sanctuary. Main objective of this program is to provide adequate protection to the WS for the conservation of its constituent biodiversity. Main activities to be carried out to achieve this objective include :

i) Updating forest cover and interface landscape maps : The forest cover/landscape mapping for Rema-Kalenga WS (and all of Tarap Hill RF) as available with FD (based on 1996 satellite imagery and relevant FD records) will be updated.
ii) Identifying and demarcating the Sanctuary boundary : All the peripheral boundaries of the WS will be identified, surveyed and marked on the ground. Survey and demarcation of the

peripheral boundaries of the WS will be done during the first year of Plan implementation when encroachment areas will also be identified and evicted after obtaining their voluntary consent.

iii) Controlling illegal removals from the WS : Mobilizing local stakeholders through co-management organizations (co-management councils/committees, user groups and patrol groups). Illicit felling in and around the Sanctuary will be checked through extensive joint patrolling (FD staff, and local stakeholders formed as community patrolling groups) inside the forests. The villagers from Forest Villages (e.g. Debrabari) will be very helpful in forest protection efforts.

iv) Checking of organized smuggling : Timber smuggling and poaching will be checked through concerted efforts from FD by using modern equipments and transport facilities. In such cases there may be need for sophisticated fire arms and ammunition and training to combat organized poachers and smugglers.

v) Controlling forest fires and forest grazing : Control of forest fires will be done by involving local stakeholders. Existing paths/tracks will be used as fire lines as well and will be maintained so by cutting and control burning of grasses and debris twice a year (say in December and March/April). Existing patrolling paths will be cleaned every year before fire season. Additional fire lines will be created at strategic places including regeneration areas.

vi) Checking encroachment of the Sanctuary lands.

vii) Co-management committees will be responsible for overseeing the protection efforts of community patrolling groups formed for the protection of identified patches of forests vulnerable to illicit felling.

2. MANAGEMENT PROGRAMS

Main objectives of the management program are to :

i) maintain ecological succession in constituent forests by providing effective protection against biotic interference (illegal felling poaching, forest fires, forest grazing, forest land encroachment, etc.) ,

ii) maintain and develop natural forests as good habitat favoring wildlife,

iii) conserve the forest resources including the constituent biodiversity, and

iv) establish appropriate co-management practices through key stakeholders' consultations and their active participation.

2.1 Core Zone Management

The Sanctuary's notified area and surrounding forests and land-use are divided into two broad zones (core zone and interface landscape zone, each subdivided further into specific sub-zones) based on existing forests, landscape elements and management objectives. The entire notified area of Rema-Kalenga WS is designated as core zone (Figure 2), which has high conservation value. All the well stocked areas with wildlife are covered under the core zone, where management objective is to protect and maintain remaining vegetation in good stocking and encourage natural regeneration in degraded areas to gradually bring back natural forests. The core zone is sub-divided into three specific sub-zones: i) Ecosystem sub-zone, ii) Habitat Management sub-zone, and iii) Sustainable Use sub-zone.

Main management aim in Ecosystem Management sub-zone is long-term protection of existing vegetation including remaining natural forests and mixed plantations, and rehabilitation toward natural forests habitat. Forests management in this sub-zone will focus on conserving the remaining natural forests and bringing back natural vegetation, wherever possible. This will be achieved by :

- providing protection (against illicit removals of forest produce, poaching, encroachment, grazing and fire) and encouraging natural processes for regeneration and rehabilitation of forests.
- monoculture of teak and other exotic species need canopy manipulation in order to create more favorable habitat for wildlife by encouraging natural regeneration of miscellaneous species
- implementing assisted natural regeneration practices including enrichment planting of indigenous trees, shrubs, herbs and palatable grasses.
- subsidiary silvicultural operations will be carried out wherever necessary to encourage natural vegetation.
- effective protection against biotic pressure (illicit felling, forest land encroachment, poaching, forest fire and forest grazing) will allow natural processes of regeneration in degraded forest areas.
- co-management practices will be implemented (through associated co-management committees/councils, community patrolling groups and user groups to be formed at different levels) in strengthening protection efforts against illicit felling, forest land encroachment, forest fires and cattle grazing.
- in *lieu* of reduced removals by the local communities (e.g. Debrabari Forest Village), they will be provided alternative income generation activities for sustainable livelihoods.

Habitat management sub-zone, as a part of core zone, is constituted to manage the habitat for wildlife management and conserve forests and other critical habitats. This will be achieved by :

- Main factors responsible for habitat degradation will be identified by holding stakeholders consultations.
- Protection against the identified causal factors including illicit felling, forest fires and grazing, forest land encroachment and poaching will be provided by involving all the stakeholders.
- maintaining and if possible augmenting forest cover by using assisted natural regeneration techniques such as enrichment plantations, and subsidiary silvicultural operations.
- habitat requirements of capped langur, as a representative species, will guide management decisions and monitoring of forests ecosystem.
- habitat improvement works including rehabilitation and regeneration of degraded forests ecosystem,
- enrichment planting of fruit bearing shrubs and trees and palatable grasses,
- thinning of plantations,
- maintenance of glades and waterholes,
- eradication of weeds from glades and wetlands,
- soil and water conservation, and watershed development works will be taken up, wherever required,
- gradual opening of top canopy in exotic plantations will be taken up mainly to replace exotic species and encourage natural regeneration to come up and get established.
- removal of congestion is required for easy movement of wildlife and so the existing cane plantations will be worked properly to create congenial habitat for wildlife. Similarly bamboo clumps will be decongested as an important silvicultural operation.
- two canopy manipulations say at 10^{th} and 15^{th} year of plantations can be taken up.
- existing grasslands will be maintained and will be further developed by taking up grass plantations along with other tree species as a part of enrichment plantations in identified gaps.
- plantations of palatable grasses will be taken up in blank patches.
- enrichment plantations will be taken in those areas where natural regeneration is not coming up due to lack of rootstock.

All homesteads, cultivation fields and settlements within the WS will be included in the Sustainable Use sub-zone. Forest Village (Debrabari) and agricultural land within the WS included under this sub-zone will be marked and no further in-migration will be allowed. Such areas existing at the time of notification will be delineated with permanent markers. Similarly the existing inhabitants will be registered and further in-migration will be discouraged. Intensive use sub-zone incorporates the relatively small areas required for administrative buildings and staff quarters, visitor accommodations and other Sanctuary facilities.

2.1.1 Enrichment Plantations Guidelines :

Enrichment plantations will be taken up on priority in identified areas of the core zone (but also in buffer reserves of landscape zone) as discussed below :

- Development of nurseries at least one year in advance of enrichment planting
- Identification of suitable gaps for planting and advance closure against biotic pressure such as illicit felling and forest fires
- On an average 360 seedlings per ha mainly mixture of indigenous species (multi-species plantations to optimize species and habitat heterogeneity) will be planted.
- Pits of size 45m x 45m x 45m will be dug in the month of Feb. – March (1 kg of cowdung/fertilizer will be applied) in identified gaps (of more than 0.5 ha). The application of fertilizer will @ 50 gms per seedling (20 gms TSP, 20 gms MP and 10 gms Urea).
- No burning and clear cutting of existing vegetation will be taken up. In case of weeds a circular area (of 1 m radius) around the pit can be cleared before taking up planting on the onset of monsoon rains (in the month of June-July). The dead and hollow trees will not be salvaged as they may be useful for wildlife.
- Subsidiary silvicultural operations such as cleaning, climber cutting and freeing of natural regeneration from suppression will be taken up as a part of encouraging natural regeneration. Priority will be given to clean those saplings and seedlings firstly that have shown manifestations of diseased/dead/crooked growth, damage, and infestation. In coppice species, stump dressing, stool thinning (retaining 2-3 shoots per stool) and cleaning will be taken up. Bamboo clumps will be decongested.
- Half-moon trenches around the planted seedlings are suggested in the slopes as an integral part to conserve and trap soil and retain soil moisture.
- Weeding, beating up and cleaning will be taken up as and when required. Normally 3 weeding are taken up in the 2nd financial year and 2 weeding in the 3rd financial year. Vacancy filling will be done along with weeding.
- Suitable species for enrichment plantations are mainly mixture of indigenous species that may include siris, sisoo, simul, chikrasi, jarul, gamar, garjan, telsur, koroi, champa, mahogany, kadam, arjun, haritoki, pitali, chapalish, boilam, agar, hargoja, padauk, jam, dhakijam, toon, bazna, jalpai, chalta, amla, bahera, ficus species, bamboo, etc. Canes planting and monoculture will be avoided.
- Exotic species such as acacia, eucalyptus and mangium will not be plated inside the core zone.
- Palatable grasses for fodder plantations may include *Typha angustifolia, Alpimia nigra, Themeda arundinacea, Saccharum arundinaceum, Sacharum longisetosum, Sacharum narenga, Sacharum hookeri, Phragmites karka, Arundo donax, Impreta cylinder, Sacharum spontaneum, Cymbopogan flexuosus* and *Setaria palmafolia*. These grasses may also be used for gully plugging in case soil erosion takes place due to gradient and run off.
- Plantation of shrubs and grasses may be taken up around waterbodies by involving local stakeholders.
- Forest fire control measures will be taken up in fore prone areas.

2.2 Interface Landscape Zone Management

Interface landscape zone is categorized into 2 sub-zones (Support sub-zone and Tea Estate Land sub-zone) depending upon the uses to which different areas are managed. Interface landscape zone will focus on the surrounding landscape helpful in protecting and conserving the biodiversity in core zone by :

- creating congenial habitat for wildlife including protecting and maintaining surrounding wildlife areas and corridors.
- as opportunities for receiving tangible benefits from the conservation-oriented management of the core zone are very less, off-Sanctuary livelihood opportunities will be provided to the local stakeholders in the surrounding landscape.
- consumptive use of forests by the resident villagers within the WS will be limited to the existing Forest Village (Debrabari) situated within the WS. Consumptive use by non-residents will be shifted gradually to a 5 km-wide external support sub-zone bordering the Bangladesh portion of the Sanctuary boundary (comprising FD lands and *khas* lands).
- Livelihood activities for the poor stakeholders will be taken as described in the next section.

2.2.1 Buffer Plantations Guidelines :

The following guidelines will be adopted while raising buffer plantations in buffer reserves of interface landscape zone :

- Block plantations of both indigenous (list as in case of enrichment plantations) and fast growing species such as acacia, raintree, gamari and neem will be taken in mixture at 2m x 2m (2500 seedlings/ha) by associating local stakeholders (e.g. members of community patrolling groups and user groups).
- The rotation age for the fast growing species would be 10 years (two thinning at 4^{th} and 7^{th} year) and 30 years (two thinning at 10^{th} and 20^{th} year) for long rotation species. The fruit bearing trees suitable for wildlife will be retained at the time of felling.
- The usufructury benefits from 2^{nd} thinning and final felling will be shared by following the FSP guidelines (45% of the total proceeds to FD, 45% to participants and 10% to co-management committee - as in case of Tree Farming Fund under FSP).
- Other plantation guidelines will be as described above for enrichment plantations.

2.2.2 Strip Plantations Guidelines

Main objective of raising strip plantations will be to meet the demands of local stakeholders for fuelwood/timber, improve local environment and raise their income by utilizing vacant strips along raods maintained by Union Parishads and Government Departments such as Roads & Highways and Local Government Engineering. The co-management committee may be involved in the formation of user groups by identifying local stakeholders (say 15-20 participants in each user group). While selecting local participants preference will be given to the poor sections including destitutes, women and indigenous community. Suitable strips along roads will be identified for raising plantations will be assigned to a user group in such a way that each participant's share would on an average be 100m (on both sides).

The tree species suitable for planning in mixture include *Albizia procera, Albizia lebbek, Albizia richardiana, Swietenia mahogany, , Delbeergia sissoo, Acacia nilotica, Acacia auriculiformis, Gmgelina arborea, Terminalia arjuna, Anthocephalus kadamba*, etc. Fruit bearing species (e.g. *Artocarpus integrifolia* and *Mangifera indica*) will make 10% of the total species and will be planted every 20m. About 35% of the tree species will be of long rotation suitable for timber and so every 4^{th} planted seedling will be long rotation species. The remaining 65% of the tree species will be of fast growing species (both indigenous and exotic) producing fuelwood and timber. A 2m spacing accommodates 500 seedlings/km

on each side of a road. It means that 1,000 seedlings will be planted on both sides of 1 km strip. A live hedge will be established by line sowing of Arhar (*Cajanus cajan*) and/or Dhaincha (*Sesbania sesban*). The produce from strip plantations will be shared by following FSP benefit sharing arrangements. After selecting a road and forming a user group, the staking and pitting (of size 45cm x 45cm x 45cm) will be done. Planting should be underway as soon as monsoon is established and the upper soil profile becomes moist. Depending upon the site conditions, manure (on an average 1 kg/seedling) and fertilizer (on an average TSP @ 6 gm/seedling) may be given at the time of planting and beating up (the first casuality replacement may be taken up in August if initial survival rate is less than 85%). Three weeding in the first year and two in second year will be done in accordance with standard practices.

3. LIVELIHOOD PROGRAMS

Appropriate linkages with relevant livelihood programs (to be implemented mainly in landscape zone) will be developed to reduce biotic pressure on forests by :

- providing alternative livelihood opportunities to poor stakeholders living both within and outside of the WS.
- up-scaling of skills will be taken up for generating value additions through capacity building of local people.
- Landscape Development Fund will be used to provide finance for the members of organized groups and co-management committees.
- User groups and their federations will be encouraged to set up micro-enterprises to generate value additions locally.
- benefits from eco-tourism will be ploughed back for the development of local communities and the WS.
- appropriate production technologies as below will be implemented :

The following production agricultural/horticultural technologies are proposed :

- Integrated homestead farming
- Cultivation of high value crops
- Tree nursery and homestead planting
- Food storage, processing and marketing

Appropriate livestock rearing practices will be as below :

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

The following production technologies were identified for the fishery sector :

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

Small enterprise development activities will include as below :

- Primary sectors for potential development around the Sanctuary include handicrafts (with cane, bamboo and murta as raw material), nursery development, food processing (pickle, jam, jelly), weaving and natural dye processing, and bee keeping.
- Secondary sectors include herbal tea (basak, chamomile, shefali) cultivation and processing, medicinal plantations and processing, essential oil processing, buffer plantations, orchid cultivation and floriculture, eco-tourism and nature-based healing homes development.

- Priority sectors such as bamboo and canes, nursery and natural dye processing may initially be taken up for enterprise development.

4. FACILITIES DEVELOPMENT AND MAINTENANCE PROGRAMS

The following development of Sanctuary facilities will be undertaken to support the long-term administration :

- procurement of transport and other equipments required by FD.
- existing FD facilities will be fully utilised and incorporated in Sanctuary management where these can be renovated on a cost-effective basis.
- Built facilities (constructions based on sound environmental principles) will be concentrated in three areas, comprising:
  - Sanctuary Headquarters (incorporating the existing Range & Beat Office facilities at Rema-Kalenga);
  - Guard Camp at Kalenga Chara; and,
  - Guard Camp at the Rema Tea Estate/Sanctuary boundary.
- road access to the Sanctuary Headquarters, currently provided by a fair weather, unsurfaced road linking the Kalenga and Rema Beat Offices, will be maintained.
- road linking the Kalenga and Rema and Chonbari Beat Offices will be maintained to a sufficient standard to permit year-round access by Sanctuary and other FD staff using motorcycles.
- vehicles, field equipment and office equipment will be provided as required to support the management and administration programs.

5. VISITOR USE AND VISITOR MANAGEMENT PROGRAMS

Regulated eco-tourism in the form of nature education and interpretation tours will be main objectives of visitor use and management programs. This will help promote biodiversity conservation and educate the visitors as enlightened nature tourists. However, a close watch will kept on carrying capacity while allowing visitors. Socio-economic benefits of eco-tourism will be accrued to local people through forward and backward linkages. Specific activities will include :

- eco-tourism regions (3 hiking trails have already been identified around which visitors will be guided through appropriate signages) will be identified by linking with other local and regional attractions including a good view of FD Guest Houses, tribal villages, rolling landscapes, wetlands and tea gardens through forest roads and trails.
- care will be taken to preserve the local traditions and culture of indigenous by avoiding intrusive, exploitative and commercial behavior while implementing visitor program.
- existing roads and trails will be renovated for easy movement in tourism zone.
- brochurs, pamphlets, guide maps, hand outs, audiovisual aids, display boards will be developed at convenient points (e.g. Kiosks will be set up).
- Mass Communication Officer of FD will provide help in publicity programs.
- local youths/naturalists preferably from local schools, youth clubs and Nishorgo clubs will be encouraged to act as eco-guides and nature interpreters. They will be trained as eco-guides by organizing a series of training workshops on communication and interpretation skills (including on what to speak, how to speak, presentation skills, body language assessment, team building exercises, etc.).
- nature camps (of 1-2 days duration) may be organized at places of interest within the WS for students and youths for learning by experience and discussions on biodiversity conservation issues. Camp accommodation will be provided in temporary tents to be established near sites (e.g. Chonbari) of interest. Local NGOs and naturalists may help in establishing nature camps.

- networks of nature trails will be developed for visitors movement on foot and bicycle, traversing key natural and cultural features of interest (e.g. patches of high forests, betel leaf gardens, cultural remnants, natural streams/*cheras*, religious places, tribal villages, caves, etc.).
- existing FRHs will be connected with nature trails.
- priority will be given to develop existing foot paths and vehicle tracks as far as possible in order to minimize creation of new paths and consequent vegetation clearances and soil erosion.
- Environmental Education Centre will be developed and connected by one such trail for visitor access. This will include guidelines of expected behavior (e.g. litter disposal, vehicle use, etc.) of visitors while visiting the Sanctuary.

6. CONSERVATION RESEARCH, MONITORING AND CAPACITY BUILDING PROGRAMS

A research, monitoring and capacity building program will be developed with main objectives :

i) to better understand the Sanctuary's biodiversity resources, ecosystem and landscape environment,
ii) to establish a baseline listing of all flora and fauna species for assessing their current abundance, distribution, and functional relationship among biotic communities
iii) to develop quantitative population estimates for selected key species (capped langurs), and develop detailed information on their current distribution and habitat use,
iv) identify and map key patches of remnant forests and other critical habitats,
v) identify priority research and monitoring topics to help guide the development of Sanctuary's management program, and
vi) gradually reduce the extent and degree of uncertainty while taking the Sanctuary management decisions.

A detailed methodology for establishing benchmark data and measuring the volume of timber loss (cubic meter/ha) has been developed for assessing unauthorized logging in the sampled forest patches. A survey of natural regeneration (density of seedlings and saplings per ha) in the forests will be taken regularly. This will be complemented by photo monitoring technique, focusing on changes in plant height as a visual evidence of success. Forest dwelling bird species are being used for assessing biodiversity status. A simple procedure of sighting and counting (either population or nests) the indicator bird species using the forests as their habitat has been employed by associating local stakeholders in identified transect walks. Benchmark measurements will be taken to establish initial set of values which will act as reference for future comparison with subsequent measurements taken periodically for assessing socio-economic impacts of project interventions. Management score cards will be employed in making management assessments.