

## 8. FORESTRY AND BIODIVERSITY CONSERVATION PLAN

### 8.1 INTRODUCTION

This Forestry and Biodiversity Conservation Plan (FBCP) is prepared as a component of the DEMP. The Plan identifies the activities related to the project works, includes management plans that have been developed to address the key issues that could arise during project pre-construction, construction and operation and maintenance works in forestry and biodiversity of the project area and includes control or mitigation measures, monitoring and auditing plan for forestry and biodiversity conservation.

### 8.2 OVERALL OBJECTIVES

The overall objectives of the FBCP are to:

- Establish specific measures to minimize the adverse impact on forestry and biodiversity conservation and to enhance forestry and ecological characteristics of the project area;
- Assure required standards of mitigation measures for forestry and biodiversity conservation are maintained throughout the project works; and to
- Prepare monitoring and auditing plan to verify that the protection standards are met.

### 8.3 GOAL

The goal of the Forestry and Biodiversity Conservation Plan is:

- to conserve and enhance the quality of forests, manage forest resources sustainably and to improve the livelihood of local communities; and
- to conserve and enhance characteristic biodiversity of the area, wildlife value of all habitats ensuring sound population of wildlife species and to increase public awareness and understanding of wildlife of the area.

### 8.4 OBJECTIVE OF FORESTRY MANAGEMENT PLAN

The plan proposes objectives for forestry and biodiversity conservation to attain the goal for the area; and a number of outputs designed to achieve the objectives. Several activities are set out for achieving each output.

#### **8.4.1 Objective for Forestry**

The immediate objective for forestry is to mitigate adverse impacts of the project implementation on forest resources of the area.

#### **8.4.2 Outputs and Activities**

##### **8.4.2.1 Outputs for Forestry**

The outputs for forestry are:

1. Effective compensation for the loss of forest trees, shrublands and grasslands of the Direct Impact Zone;
2. Enhance and maintain forests in the Indirect Impact Zone and in other areas of the two districts;
3. Effective protection of rare and threatened plant species;
4. Enhance capacity of Baitadi and Darchula, District Forest Office staff and other key stakeholders; and
5. Enhance general awareness on forestry and benefits from forests.

##### **Output 1: Effective compensation for the loss of forest trees, shrub lands and grasslands of DIZ**

The loss of forest area (2958.6 ha) in the DIZ is irreversible. All the trees within the DIZ would be clear-felled for the construction of the dam. As a compensatory measure for the loss of forest trees, it is statutory to plant 25 saplings for each and every tree felled and to take care of the planted saplings for five years. It is estimated that about a total of 627,000 trees would be felled (all trees below 680 m asl) and for different project facilities and services – access roads, quarry sites, etc. The Sal forest, Terai Mixed Hardwood forest, Lower Mixed Hardwood forest, Pine and Khair Sissoo forest within the DIZ would be most affected.

Forest clear felling involves –marking, measuring and recording each and every tree within the DIZ, and auction, etc. Every care should be taken during clearing felling so that there is as little damage as possible.

Since the large number of saplings that would be required for the afforestation program (estimated to be around 17 million saplings) won't be available from the existing nearby forest nurseries, at least large forest nurseries and several other small forest nurseries have to be established in the IIZ and within the two districts. It is also likely that there won't be enough area (estimated about 9800 ha) within the two affected districts for afforestation program.

The loss of Sal trees is of major concern as it would be difficult to establish Sal tree plantations. Plantations should be done in the two districts and in Dadeldhura and Bajhang districts as well. As a compensation for the loss of Sal trees, support should be provided to protect Sal forests in Terai districts in addition to Sal forests in Baitadi, Darchula, Dadeldhura and Bajhang districts.

The project should work very closely and support Baitadi and Dadeldhura DFOs in clear-felling the area according to the Forest Regulations, to establish forest nurseries and conduct afforestation programs.

##### **Activities**

- Support District Forest Offices to manage forest clear felling according to the Forest Regulation
- Select sites for nursery and establish forest nurseries
- Raise saplings of appropriate tree species for plantation

- Select sites for compensatory plantations in Baitadi, Darchula, Dadeldhura and Bajhang districts
- Carry out compensatory plantation
- Provide appropriate protection for the plantation sites

### **Output 2: Enhance and maintain forests in the IIZ and in other areas of project districts**

The forests in the indirect zone and in other areas should be protected and enhanced. The project should support district forest offices, community forests, religious, collaborative forest user groups and private forest owners in protecting and managing forests. It would require proper coordination and support from all stakeholders to protect the forests from forest encroachment, forest fires, illegal timber felling, over-exploitation of rangelands and unsustainable livestock practices, illegal collection and over-harvesting NTFP, including medicinal and aromatic plants.

Integrated forest management plan should be developed for the two districts. The objective of the plan should be to reduce the growing deficit between the increasing demand and the sustainable supply of forest products.

#### **Activities**

- Strengthen and provide support DFOs for effective forest law enforcement
- Support and strengthen community-based organization in protection and management of forests
- Support handover of community forests and to update community forest operational plan as necessary
- Develop integrated forest management for the two districts and support to implement the plan ensuring multi-stakeholder participation
- Establish fire lines and provide trainings and necessary firefighting equipment to district forest offices, and CFUGs
- Conduct awareness program about the fire hazards especially in the dry season
- Take appropriate preventive and remedial measures to control forest fires
- Rehabilitate degraded forests
- Develop and implement appropriate soil erosion and watershed protection program
- Provide training and support for sustainable collection, storage, transportation and marketing of NTFPs
- Promote sustainable livestock development program
- Promote and support alternative energy program
- Encourage agro-forestry in agricultural lands
- Provide trainings and support income generation and other community development programs
- Stimulate economic growth and jobs for local population

### **Outputs 3: Effective protection of rare and threatened plant species**

Removal of rare, threatened and endangered plant species should be avoided in all areas as far as possible. The forest nursery should raise saplings of species such as Khair, Sissoo, Sal, Karma, Asna, Salla, shrub species Kamini, Rohini, Sati bayar, Woodfordia, Amala, Parijat etc. and plant them in natural habitats.

**Activities**

- Identify and protect rare, threatened and endangered species in their natural habitat
- Raise rare, threatened and endangered species in forest nurseries and plant the saplings in appropriate sites
- Develop and widely distribute leaflets, brochures and other information on rare, threatened and endangered flora of the area
- Support the Department of Botany to establish a Botanical Garden in the area for ex-situ conservation
- Develop incentive mechanism to enthusiastic and interested individuals, groups, and communities in maintaining and protecting forests and in appropriate economic development

**Output 4: Enhance capacity of Baitadi and Darchula DFO staff and other key stakeholders**

The capacity of local stakeholders to protect and management forest resources needs to be enhanced. Only motivated well-trained skilled personnel and necessary equipments increase the efficiency and effectiveness in protecting and managing forests. The project should continuously work to enhance the capacity of DFO staff and key stakeholders by providing necessary capacity enhancement trainings and establishing proper incentive mechanism.

**Activities**

- Conduct capacity enhancement need assessment for District Forest Office Staff, Community Forest User Groups, Leasehold Forest User Groups and other key stakeholders
- Conduct capacity enhancement trainings to DFO staff, CFUG, LFUG and other key stakeholders in forest management
- Provide support to District Forest Offices, Community Forest and Leasehold Forest User Groups and other key stakeholders
- Establish proper incentive mechanism for DFO staff and Community Forest User Group members
- Establish refresher trainings
- Establish mechanism for scholarship for advanced studies in forestry
- Conduct field visits and educational tours

**Output 5: Enhance general awareness on forestry and benefits from forests**

Better understanding on forests and its importance among people at large helps better forest protection and management. General awareness program should target especially local schools and conservation groups.

The objective of the program should be to disseminate the importance of plants, wild animals, ecosystems and ecological processes, rare and endangered species, medicinal and aromatic plants, species of high economic value and the need to address forestry issues. Conservation education and awareness program should use materials and examples from local area. Similarly, information and experiences sharing among all stakeholders is important for better understanding and a sense of ownership.

**Activities**

- Develop and widely distribute information brochures, leaflets and other information materials
- Develop checklist and photographic booklets on rare and endangered species, medicinal and aromatic plants of the region for distribution

- Develop newsletter or other media and disseminate information effectively to key stakeholders
- Establish better communication mechanism among all stakeholders
- Conduct awareness campaign
- Celebrate special day celebrations
- Organize excursions and education tours
- Organize field visits of the area for key stakeholders
- Establish regular multi-stakeholder meetings
- Promote professional and academic research on species and disseminate the results

## **8.5 OBJECTIVE OF BIODIVERSITY MANAGEMENT PLAN**

The immediate objective is to mitigate adverse impacts on characteristic biodiversity of the project area during site clearance, construction, maintenance and operation of the project.

### **8.5.1 Outputs and Activities**

#### **8.5.1.1 Outputs for Biodiversity Conservation**

The outputs for biodiversity conservation are:

1. Wildlife habitats in the IIZ is protected, enhanced and maintained;
2. Trans boundary migration is maintained;
3. Human-wildlife conflict is minimized;
4. Wildlife poaching and illegal wildlife trade is controlled;
5. Disturbance due to construction is minimized;
6. Propagation of invasive is controlled;
7. Behavioral modification is minimized;
8. Impact on Ecosystem and biodiversity is minimized;
9. Data base, information system on impacts on biodiversity and feedback from continuous monitoring and evaluation is established;
10. Trans-boundary co-operation between Nepal and India is improved;
11. Capacity of key stakeholders is strengthened;
12. General awareness on biodiversity and its importance is enhanced; and
13. Livelihood of local communities is improved.

## **8.6 OBJECTIVE FOR WILDLIFE MANAGEMENT PLAN**

The immediate objective is to mitigate adverse impacts of the PMP on wildlife of the area during site clearance, construction, maintenance and operation of the project.

### **8.6.1 Outputs and Activities**

#### **8.6.1.1 Outputs for Wildlife Management Plan**

The outputs for wildlife management plan are as follows:

1. Wildlife habitats in the IIZ is protected, enhanced and maintained;
2. Protection and enhancement of endangered species to prevent extinction;
3. Minimize impact of restriction of trans-boundary movement and habitat fragmentation;
4. Minimize impact due to landslide and soil erosion;
5. Threat due to increased hunting and poaching;
6. Minimize disturbance to wild life;

7. Minimize invasion due to alien species;
8. Minimize impact on downstream habitat (Shukla Phanta Reserve);
9. Develop Ecotourism;
10. Data base, information system on impacts on wildlife and feedback from continuous monitoring and evaluation is established; and
11. General awareness on wildlife protection and its importance is enhanced.

## **8.7 OBJECTIVE FOR AVI FAUNA MANAGEMENT PLAN**

The immediate objective is to mitigate adverse impacts of the PMP area during site clearance, construction, maintenance and operation of the project.

### **8.7.1 Outputs and Activities**

#### **8.7.1.1 Outputs for Avifauna Management Plan**

The outputs for avifauna management plan are as follows:

1. Ensure alternative Habitat creation;
2. Minimize disturbance due to construction;
3. Threat due to increased human population;
4. Nesting and feeding;
5. Trans-boundary movement;
6. Develop Ecotourism;
7. Data base, information system on impacts on avifauna and feedback from continuous monitoring and evaluation is established; and
8. General awareness on avifauna protection and its importance is enhanced.

## **8.8 OBJECTIVE FOR WETLAND AND WETLAND VEGETATION MANAGEMENT PLAN**

The immediate objective is to mitigate adverse impacts of the PMP on wetland and wetland vegetation in the project area during site clearance, construction, maintenance and operation of the project.

### **8.8.1 Outputs and Activities**

#### **8.8.1.1 Outputs for Ecotourism Development Plan**

The outputs for wetland and wetland vegetation management plan are as follows:

1. Ensure safe disposal of excavated material;
2. Minimize disturbance to plant species;
3. Control disposal of garbage into wetlands;
4. Alternative for destruction caused due to impoundment;
5. Alternative for lost flora and fauna;
6. Control low water level downstream;
7. Control change in microclimate;
8. Control possible change in water quality;
9. Alternate arrangement for encroachment of wetlands
10. Data base, information system on impacts on wetland, wetland vegetation and feedback from continuous monitoring and evaluation is established; and
11. General awareness on wetland and wetland vegetation protection and its importance is enhanced.