

Bhutan For Life

**Environmental and Social
Management Plan for Forest
Resource, Planning and
Monitoring Division**

January 2023 - June 2024

Forest Resource, Planning and Monitoring Division / Thimphu

Table of Contents

1. Introduction	3
1.1 Project Background.....	3
1.2 Scope of ESMP	3
1.3 Purpose of ESMP	3
1.4 Applicable law, policies, and regulation	4
2. Environmental and Socio-Economic Conditions.....	5
3. Planned activities for January 2023 - June 2024	11
3.1 Establishment of Cane and Bamboo Enterprise	12
3.2 Creation of new plantation	12
3.3 Maintenance of existing plantation	14
3.4 Creation of habitat enrichment plantation	14
4. Potential social and environmental impacts	15
4.1 Establishment of Cane and Bamboo Enterprise at Banjar.....	15
4.2 Creation of new plantation	15
4.3 Maintenance of existing plantation	16
4.4 Creation of enrichment plantation.....	16
5. Mitigation Measures for Environmental and Social Impacts.....	16
6. ESMP Implementation arrangements	23
7. ESMP monitoring arrangements.....	23
8. Capacity Need and Budget	25
9. Consultation and Disclosure Mechanisms	26
10. Stakeholder engagement plan.....	26

Bhutan for Life
Environmental and Social Management Plan for Forest Resource, Planning and
Monitoring Division (FRPMD) for January 2023 - June 2024

1. Introduction

1.1 Project Background

The Bhutan for Life (BFL) project aims to ensure a robust network of Protected Areas (PAs) and Biological Corridors (BCs) that secure human well-being, biodiversity conservation and increase climate resilience in Bhutan. The project shall sustain for 14-years, in this duration an immediate improvement to the management of Bhutan's protected areas for climate resilience and biodiversity gains are sought. Meanwhile the country would gradually ratchet up its own financing resources.

BFL seeks to achieve the following objectives:

- Help Bhutan remain carbon neutral by increasing forest and vegetative cover within the Protected Area System;
- Enhance the socio-economic wellbeing of communities in the vicinity of the PAS through climate-informed natural resources management;
- Maintain stable, thriving, and diverse populations of key species contributing toward national and global biodiversity goals; and
- Strengthen organizational, institutional, and financial capacity for effective management of PAS. BFL includes five components that reflect these goals, divided into 16 milestones (or outputs) and over 80 detailed activities.

1.2 Scope of ESMP

The preparation of this Environmental and Social Management Plan (ESMP) was deemed necessary in order to manage the environmental and social impacts. The mitigation actions required to implement the project was in accordance with the requirements of WWF's Social Safeguards Integrated Policies and Procedures (SIPP), the project's Environmental and Social Management Framework (ESMF), and the applicable national legislation and regulations.

The ESMP provides an overview of the environmental and social baseline conditions on the routes of the proposed second segment of the project, summarizes the potential impacts associated with the proposed activities and sets out the management measures required to mitigate any potential negative impacts.

This ESMP will be implemented by BFL focal person in each park authority (PA) and biological corridor (BC), and by the contractor to be commissioned by each PA/BC for the project.

1.3 Purpose of ESMP

This site-specific ESMP is a project-specific source document detailing the environmental and social protection requirements to mitigate and minimize the adverse impacts. The ESMP's primary purpose is to ensure that the environmental requirements and social commitments associated with the project are carried forward into implementation and operational phases of the project and are effectively managed. The specific objectives of this ESMP are as hereunder:

- Minimizing any adverse environmental, social and health impacts resulting from the project activities;
- Conducting all project activities in accordance with the relevant RGoB Laws and WWF's safeguard operational policies and guidelines;
- Preventing environmental degradation as a result of either individual subprojects or their cumulative effects;
- Enhancing the positive environmental and social outcomes of project activities;
- Ensuring that the proposed mitigation measures are feasible and cost-efficient;
- Providing an Action Plan to ensure that the project impact mitigation measures are properly implemented and monitored; and
- Ensuring that all stakeholders are engaged in the project activities' preparation and implementation, and their concerns are fully addressed.

1.4 Applicable law, policies, and regulation

This ESMP is developed in strict adherence and compliance to the guidelines set forth in BFL's ESMF.

Applicable RGoB laws and policies include the Constitution of the Kingdom of Bhutan, 2008; legislation on land and moveable property (Land Act of Bhutan 2007; Land Rules, 2007; The Moveable Cultural Property act of Bhutan, 2005); legislation and regulations on forests and protected areas (National Environment Protection Act, 2007; Forest and Nature Conservation Act of Bhutan, 1995; Forest and Nature Conservation Rules and Regulations of Bhutan, 2017; National Forest Policy, 2011); legislation on water and waste prevention (Water Act of Bhutan, 2011; Waste Prevention and Management Act, 2009); legislative requirements on environmental assessment (Environmental Assessment Act, 2000 and Regulations on the Environmental Clearance of Projects, 2001); and other relevant laws (The Local Government Act of Bhutan, 2009; Livestock Act of Bhutan, 2001; The Biodiversity Act of Bhutan, 2003; The Pesticides Act of Bhutan, 2000; The Penal Code of Bhutan, 2004; National Access and Benefit Sharing (ABS) Policy (Draft), 2014), and Local Government Act of Bhutan, 2009.

WWF's safeguards policies that are relevant to this project are as follows:

- Policy on Environment and Social Risk Management;
- Policy on Protection of Natural Habitats;
- Policy on Involuntary Resettlement; Policy on Indigenous Peoples;
- Standard on Pest Management;
- Policy on Accountability and Grievance System;
- Standard on Physical Cultural Resources;
- General standards on both occupational and community health and safety and energy efficiency.

In general, RGoB's laws, policies, and guidelines are in line with the WWF's environmental and social safeguards requirements. However, there are a few differences between the two systems. Regarding environmental impacts, there are no direct contradictions between the RGoB laws and regulations and the WWF's SIPP, but the requirement of the latter is more extensive. All project activities should fully comply both with the RGoBs Regulations on the Environmental Clearance of Projects, and with the procedures and mitigation measures prescribed in this ESMF. In case the

WWF's SIPP requirements turn out to be extensive, strict, or detailed compared to RGoB legislation and policies, the former will apply to all project activities.

Regarding social impacts, the status of non-title holders and informal land use, and the commitment to participatory decision-making processes conclude the primary discrepancies between the RGoB laws and regulations and the WWF's SIPP. First, according to the WWF's SIPP, all users of land and natural resources (including people that lack any formal legal ownership title or usage rights) are eligible to some form of assistance or compensation if the project adversely affects their livelihoods. The RGoB laws only recognize the eligibility of land owners or formal users to receive compensation in such cases. Second, the WWF's SIPP require extensive community consultations during the project in order to develop various safeguards documents. RGoB legislation does not include three requirements reflected in SIPP. For the purpose of the BFL project, the provisions of the WWF's SIPP shall prevail over the RGoB legislation in all cases of discrepancy.

2. Environmental and Socio-Economic Conditions

BC6_Trashigang

The general topography for this corridor is moderate to steep slope ranging from zero degrees to more than 35 degrees. The proposed plantation site is located just above the national highway from Trashigang to Samdrup Jongkhar about 500 meters away from Yonphula domestic airport. It falls within the humid subtropical climate or subtropical oceanic highland climate as per the Koppens climates classification of Bhutan. Majority (80%) of areas falls under temperate, dry winter and warm summer, while the northern areas experiencing cold, dry winter, warm summer. The annual mean temperature is 20.80°C. The areas experience a mean precipitation of 2164.9 mm per year.

The rivers, stream and water bodies contribute to about 0.02 Percent (0.05km²) of the total corridor area mainly consisting the from portion of Nyera Ama River in West and Jomorii in East. Water bodies such as small lake, ponds, marshland and waterhole are found in its natural extent. There are about 20 mammals, 107 birds and 157 plant species (2019). However, with revision and extension of areas from 160 sq. km to 270 sq.km, additional eight Biodiversity Grids (1614 to 2092) were assigned to BC6. Currently, BC 6 has about 18 biodiversity plots to explore the flora and fauna and accordingly, implement the conservation program in it.

There is no settlement within and periphery of the proposed plantation site. The site has become degraded with scattered bushes.

BC3_Tsirang

BC-3 has a total area of 376.60 km² with elevation range of 440-2300masl and it is exactly located between JSWNP-RMNP with North-east to Phibsoo Wildlife Sanctuary in the south-west under Sarpang district. About 90% of BC (03) falls within Sarpang Forest Division and rest 10% of the area fall under Tsirang Forest Division.

The climatic condition in lower elevation adjoining PWS is hot and humid in summer while the climatic condition in the northern part of BC 3, adjoining JSWNP is cool and moderate. In general, Tsirang receive monsoon rainfall only by 2nd week of June every year. Tsirang receive less rainfall as they fall in rain shadow area an average of 1000mm and less rain fall in winter month (less than

150 mm). The River Sunkosh or Punatsangchu flows along the south-western bordering Tsirang Dzongkhag with Dagana Dzongkhag. Few perennial streams mainly; Burichu, Changchey and Patsalingchu, and Pawakhola forms tributaries fed by summer rain, drains in to Sunkosh river.

76.48 % of the area in BC-3 is covered with Broadleaved type of forest with only 4.20% of Chirpine forest and 6.71 % of mixed conifer forests found at the outer reaches of the Dzongkhag (LCMP,2010.) The other significant vegetation is the shrubs at 3.30%, which make up the higher altitude mountain slopes to the north of the Dzongkhag. Total of 180 animal species were recorded in BC-3. Dominated by barking deer, wild pigs, samber deer and elephant. Some of the critically endangered bird species found in BC 3 are White Bellied Heron and Rufous Necked Hornbill.

BC-03 covers 2 Dzongkhag (Sarpang and Tsirang) encompassing 7 Gewogs [Senge, Chudzom, Gelephu, Samtenling, Dekiling, Shershong and Gakidling] under Sarpang and 2 gewogs [Patshaling and Dunlagang (23 household of TsakaLing chiwog under PatshalingGeog resides within 2km distance)] under Tsirang. 1664 households and 106 households of Sarpang and Tsirang respectively depend on BC-3.

BC3_Sarpang

The proposed plantation site is located under three different gewogs (Shompangkha, Samtenling and Gelephu). It is being planted as normal afforestation and reforestation plantation. The area experiences cool and dry winter but hot and humid summer. The plantation sites are located in three different sites (Army OP- Shompangkha, Above Highway-Samtenling and Gelephu area; Plot-3). Therefore, the plantation sites do not have perennial water source or river/streams within the close proximity.

Plantation sites have few bushes and are mostly barren. All the three sites have been included in the degraded area mapping report falling under the best to moderately feasible category. Army OP-Shompangkha site falls within the established plantation cleared/harvested for construction of OP during early 2000's which needs replanting. It is around 100 meters away from the settlement. The other two sites fall are surrounded by the settlement.

BC7_Mongar

Topographically, BC 7 is made up of steep terrain, high cliffs and deep gorges. Vegetation comprises of broad-leaved dominated forest where few pockets of fir and mixed conifer forest on the mountain ridges. Hot summer in south and cold in the north. Kurichu the main river flows through Mongar Dzongkhag, with many other smaller streams serving as tributaries. The sherichu, moiri, gangolachu, shongjeri, Yudhiri and meramgangchu joins to form the main river Kurichu middle catchmen. There are about 21 mammals, 160 birds, 6 fishes and 8 water birds' species.

More than 300 households reside within BC 7. About 95% of the people depend on subsistence farming.

BC5_Pema Gatsel

The general topography for this corridor is moderate to steep slope ranging from zero degrees to more than 35 degrees in which the slope classification was based on the standard adopted for developing Local Forest Management Plans in Bhutan. The slope was classified at an interval of

0 – 25 degrees, 25-35 degrees and more than 35 degrees corresponding to gentle slope, moderately steep slope and steep slope respectively.

Pema Gasthel experiences an average annual rainfall of 1500 mm to 3000 mm every year.

This biological corridor has over 95% of the land covered under broad-leafed forests comprising of different layers of shrubs (3.07%) and meadows (0.03%). The total of 24 mammal species, 108 bird species, 80 butterflies, 29 fish species, 117 orchid species and 18 bamboo species are recorded under the Pema Gatshel Division. The 6 mammal species are listed under Schedule-I as per the FNCRR 2020. The 6 mammal species are *Panthera tigris*, *Panthera pardus*, *Ursus thibetanus*, *Bos gaur*, *Capricornis thar*, *Elephas maximus*.

BC5_ Samdrup Jongkhar

Ecologically, the site falls within habitat for the Great Hornbill and Rufous Necked Hornbill. Topological condition is gentle sloped areas and south facing. It falls within humid subtropical climate with summers typically long, hot and humid. Winters are mild and dry. There is small seasonal spring just a 10 meters distance from the periphery of the site.

The site has few standing native trees of which have loosely grown. The site has been planted with more than 3 species of the saplings. The site is also been fenced with barbed wire. There was sighting of sambar deer, Barking deers, hornbills and butterflies around the areas. The dominant flora around the plantation area are *Terminalia* spp, *Dubanga*, *Teak*, *Phoebe* spp, *Altingia exelsa*, *syzygium cumini* and other broadleaved spp.

Jomotsangkha Wildlife Sanctuary

Jomotsangkha Wildlife Sanctuary (JWS) has temperate forest with gentle slope of 30%. It has cool temperate climate. Since it is situated in the broadleaved forest the place receives maximum rainfall. The mix broadleaved forest is dominated by *Quercus* spp, *Exbucklandia* spp, *Symplocos* spp and *Samber*, deer, wild pig are the few animals in the site.

People practices subsistence farming (dryland) and few households' rear large number of cattle. Their source of income is from sales of vegetables and NWFP (*Rubia* and *Chirata*).

Thimphu

The Dzongkhag covers a total area of 1,748.590 square kilometres located at an altitude ranging from 2000 to 4000 meters above the sea level. The Dzongkhag has 42.9% of its area under forest cover with majority of conifer forests and few areas of cool temperate broadleaf forests and alpine meadow in the northern most regions.

Wang Chhu popularly known as Thimphu chu is the main river basin and few smaller tributaries drains in to the main river. Though there are no specific records on the existing biodiversity of Thimphu. It is evident that there are number of flora and fauna species found within the Dzongkhag including few critically endangered fauna species like red panda, musk deer, monal and blood pheasant besides other birds, butterflies, fishes and herpeto-fauna species.

Thimphu is the political and economic centre of the country and the location of the central government.

Royal Manas National Park

Royal Manas National Park (RMNP) covers an area of 1057.28 sq. km, located at the convergence of the Indo-Gangetic and Indo-Malayan bio-geographical realm. The forest type of the park is generally sub-tropical forest. It is further classified into four eco-floristic zones; Tropical monsoon forests (< 500 m), Sub-tropical forests (500 -1000m), Warm broadleaved forests (1000 – 2000 m) and Cool broadleaved forests (2000-2714 m).

RMNP has a moist subtropical to cool temperate climate with four distinct seasons. Summer lasts from May to August with annual maximum temperature ranging from 200C to 400C. The rainfall ranges from 200 mm to 4400 mm annually. Autumn lasts between September and November experiencing changeable weather, which gradually takes on the shape of winter pattern. Characterized by cool weather and fog, winter is relatively drier with rare shower and average temperature ranges from 50C to 200C.

PMNP abounds with towering mountains punctuated with perennial rivers and transitory rivers and streams. The largest river of the country, Manas drains about two third volume of the water of the country. It springs from four major tributaries viz. Mangde Chhu, Chamkar Chhu, Kuri Chhu and Drangme Chhu in eastern and central Bhutan. The other perennial rivers such as Udigang, Kukulung, Kanamakura and Sukuntaklai rivers forms some of the important watersheds of RMNP. Many other transitory and seasonal streams are evident along the southern foothill landscapes during monsoon season.

RMNP is famed for harboring great populace of wildlife diversity. The park is home to 65 species of mammals, 497 birds, 69 fishes, 181 butterflies, 69 herpetofauna and more than 900 vascular plant species. It provides safe refuge for many charismatic and threatened species such as Royal Bengal tiger, Golden Langur, Clouded leopard, Asian elephant, Asiatic water buffalo, Asiatic wild dog and Asiatic gaur. About 48% of mammal species recorded in the Park are threatened species red listed by IUCN. The national park is also home to globally rare and endangered floral species such as *Dalbergia oleveri* (IUCN endangered species), *Aquilaria malaccensis* (IUCN vulnerable), *Taxus baccata* (Scheduled 1 species in FNCA 1995) and *Podocarpus neriifolia* the only conifer broad leaved tree found rarely distributed in the park area.

RMNP jurisdiction covers three Dzongkhags of (Zhemgang, Sarpang and Pemagatshel. There are community settlements living within and in the vicinity of Park with a total of about 1400 households with 5331 people. Majority of the people depend their livelihood on agro-farming system. They cultivate primarily paddy as food crop and grows areca nut, oranges, cardamom and ginger as cash crops. Living in the forest fringe areas, their life style is dependent on forest-based resources.

Phibsoo Wildlife Sanctuary

Phibsoo Wildlife Sanctuary (PWS) encompasses an area of 286.8 km². It is located in the Himalayan foothills of south-central Bhutan, between 26°42' to 26°51' N latitude and 89°56' to 90°12' E longitude. Its southern boundary follows the Indo-Bhutan international Border. PWS falls under humid subtropical climate of the country and experiences hot summer and cold winter ranging its elevation from 75masl -1800masl. It is also known for the lowest elevation range in

Bhutan at Nichula gewog under Dagana Dzongkhag. PWS receives incessant summer rainfall which remains wet for the entire season while winter is often welcomed by dry and sunny weather

Beside perennial and transitional rivers formed during monsoon, Sunkosh River, one of the major river in Bhutan drains through the plains of the Wildlife Sanctuary. Perennials Rivers such as Longa River, Phibsoo River and Nichula River forms an important watershed of PWS. PWS is home to 637 recorded species of flowering plants of which 528 are dicotyledons and 109 monocotyledons. These include 199 trees, 143 herbs, 134 shrubs, 79 climbers, 34 grasses, 25 ferns, and 44 orchids. Number of these species, such as *Caryota urens*, *Arundina graminifolia*, *Typha 9lephantine*, *Acer oblongum*, *Ilex godjam*, *Aristolochia tagala*, *Mesua ferrea*, *Syzygium jambos*, *Aegle marmelos*, and *Aquillaria malaccensis* are known to be rare or globally threatened. PWS is also home to diverse fauna which include 36 mammals, 365 birds, 23 fishes, 60 butterflies and 60 herpeto-fauna as of June 2020.

The Parks southern boundary follows the Indo-Bhutan international border with Ripu-Chirang Reserved Forest on the Indian side. To the west, it is flanked by Sunkosh river, to the east by edge of Senge village with indo-Bhutan border, and to the north by BC3 along northern border of Nichula gewog under Dagana dzongkhag.

Dagana

Dagana is a verdant region and over 80% of the district is under forest cover. Hardy trees like Champ, Augury, Chirpine and Sal grow throughout the region. Located below the major valleys of Thimphu and Wangdue Phodrang, Dagana stretches all the way down to the southern border of the kingdom.

Located at an elevation of 1580.23 meters (5184.48 feet) above sea level, Dagana has a Temperate highland tropical climate with dry winters climate (Classification: Cwb). The city's yearly temperature is 9.61°C (49.3°F) and it is -5.99% lower than Bhutan's averages. Dagana typically receives about 71.39 millimeters (2.81 inches) of precipitation and has 142.46 rainy days (39.03% of the time) annually. The Average annual rainfall in the Dzongkhag is 1455.10 mm. About 80% of the rain received during the summer months from June to September. The maximum rainfall is observed in the month of July (393.9 mm) and accounts for almost 27% of the total annual rainfall. The Sunkosh River flowing north to south is the main river and Dagachu as the second largest river added by numerous other streams flowing into the Sunkosh river.

Dagana Dzongkhag is blessed with mixed vegetation and beautiful weather throughout the year owing to which it's home to more than 50% of the plants spices, birds and animals which are found in Bhutan. The Dzongkhag covers a total area of 1722sqm with 5343 households and a total population of over 23760 people residing. The agriculture is the main source of livelihood for the inhabitants of the Dzongkhag, oranges and rice being the two of the main crops cultivated.

Samtse

Samtse Dzongkhag has an area of approximately 1309.1 square kilometers and has two Drungkhags (Dorokha and Tashicholing) and 15 gewogs. The majority of the topography in the Dzongkhag has gentle slope. It is bordered by Chukha Dzongkhag in the east, Haa Dzongkhag in the north and the Indian state of West Bengal and Sikkim in the south and west respectively.

It has an elevation of 600-800m above sea-level and lies in the subtropical monsoon climate zone with about 60% of the total area under forest cover. Around 16% of the total area is under the category of others, which includes snow glaciers, eroded lands, water spreads and marshy areas. The monthly temperature ranges between 15 degree Celsius in winter to 30 degree Celsius in summer and receives an annual rainfall between 1500-4000ml. The summer is hot and humid and winter is dry and moderately cool.

While there are more than 30 smaller streams mostly fed by the monsoon rain. Buduney, Sukriti, Bukey Khola, Chumpatang, Dipu, Diana and Dhamdum Khola are considered as the main river systems under Samtse Dzongkhag providing water for agriculture and drinking. Besides, there are also number of wetland, lakes and ponds in the dzongkhag.

Samtse has a sub-tropical mix broadleaved forest dominated by *Quercus* spp, *Exbucklandia* spp, *Symplocos* spp in the higher altitude areas and teak, champ, terminalia species, bombex and few bamboo species. Samber, deer, wild pig, Assamese macaque are the few of the common animals species found in the Dzongkhag. Migratory Elephant herds are quite common along most of the boarder settlements with quite a good number of avi-fauna species.

The Dzongkhag has a population of over 62500 people and 14,700 households. While only around 8% of the land is under agricultural cultivation. In the foothill of few gewogs, wetland cultivation is an important activity and rice is the staple diet along with mustard. In the northern gewogs, apart from paddy cultivation, the people also depend on dry land cultivation. Maize, Orange, cardamom and areca nut, are also grown extensively.

Phrumsengla National Park

Phrumsengla National Park (PNP) is connected to JSWNP, RMNP, BWS, WCNP. Heterogeneous geomorphology and wide range of elevation attributes to formation of special habitats for wildlife in PNP. The elevation ranges from 900 masl (sub-tropical broad-leaved forest) to about 4500 masl (Alpine meadows). Of this, the major portion, >78% of the total area is above 2500 masl. Slope classes are evenly distributed in terms of area coverage.

With vast variation of altitudinal ranges, PNP experiences wide range of temperatures as well. The northern part of the park has -21°C minimum and 13°C maximum temperatures and in the south-eastern has low of 8°C and high of 28°C. The annual average rainfall in the northern part is 700 mm and the lower elevation receives up to 1500 mm.

Despite being smallest national park, PNP serves as vital watershed area for two major river systems, Kuri chu to its left flank and chamkhar chu to its right flank. Apart from that there are numerous springs and tributaries that feeds the major river systems. The rich biodiversity of the park itself is a good indication of intact natural resources like water resources.

PNP with wide range of elevation(sub-tropical to alpine) ecosystem holds high conservation value and significance for about 1000 species of plants with over 161 species of trees, 274 shrubs and 316 herbs. The park is a home to one of the globally threatened species *Rhododendron dalhousiae* and critically endangered species at local context. Maximum area of PNP is comprised of fir forest

with 267.16 km² followed by mixed conifer and broadleaf forests. PNP is a prime refuge for many threatened flora and fauna thriving across varied vegetation zones in central region of the country's protected area landscape. More than 70 species of mammals, about 364 species of birds, and some 55 species of butterflies are recorded in the park. Significant avifauna species of conservation interest for PNP are Chestnut-breasted partridge (*Arborophila mandellii*), Rufous-necked hornbill (*Aceros nipalensis*) and Beautiful nuthatch (*Sitta formosa*) listed vulnerable under IUCN list

The park has about 6,000 inhabitants with 1,165 households living in 32 villages. Administratively, PNP spread across ten Gewogs viz Chumey, Ura and Tang Gewogs of Bumthang Dzongkhag, Saleng and Tsamang Gewogs under Mongar Dzongkhag, Jarey, Metsho and Gangzur gewogs under Lhuentse Dzongkhag, and Shingkhari and Nangkhori gewogs under Zhemgang Dzongkhag. Over 75 percent of the park area is under registered grazing grounds and most of the park residence relies mainly on livestock produces for their livelihood.

Punakha

Punakha Dzongkhag is situated in western Bhutan, bordered by Gasa to the north, Thimphu to the west and Wangduephodrang to the east and south. The Dzongkhag is located at an altitude ranging from 1100-2500 m above sea level. Currently, it serves as the winter residence for the Central Monastic Body. Around 75.87 % of its land is under forest cover mostly consisting of the broad leaf subtropical evergreen trees. The climate in Punakha Dzongkhag is hot, humid sub-tropical climate with an elevation ranging from 1100 to 2500m above the mean sea level. The temperature of Punakha Dzongkhag is about 32° C during the summer and 12°C with maximum of 19°C during the winter season. The winter season is moderately cool and comfortable whereas summer season is hot and humid.

Punakha Dzongkha has history of flooding caused by Mochu, Pochu the main river basin commonly known as the Punatsangchu. The settlements and important historical structures located along the bank of Punatsangchu exposes high flooding risk. The water is mainly used as source of irrigation to the farmers. There are number of perennial streams forms the tributaries flowing into the Punatsangchu and the Dzongkhag has abundant of water both for irrigation and household uses.

The Dzongkhag is administratively divided into eleven gewogs, well known for rice, vegetables, and fruits owing to its favorable location, soil, and climatic conditions. The main cash crops are paddy, wheat, maize and mustard, fruits like persimmon, guavas, peaches, plums, pears, avocado, and apricots are grown.

3. Planned activities for January 2023 - June 2024

The following activities will be implemented during the 5th year (2023) of the project period: The implementation of the maintenance of the existing plantations shall be one time activity carried out and completed within the 5th year of the plan. The maintenance for the creation of new plantations (normal and enrichment) under Sl. No. 2 & 3 in the table below shall continue to maintain annually until the plantations attend 5 years. The activities for the cane and bamboo enterprise development shall also spill over to the 6th year (2024) of the project.

3.1 Establishment of Cane and Bamboo Enterprise

a. Budget: Nu. 3,500,000

b. Timeline: January 2023 - June 2024

c. Location: Banjar, Tsamang Gewog, Mongar Dzongkhag (PNP)

The cane and bamboo enterprise development has been proposed at Banjar village, Tsamang gewog under Mongar Dzongkhag. The proposed site falls under the Jurisdiction of Phrumshingla National Park (PNP). The main activities to be implemented under this program shall be as follows:

- i. Consultation with the community and formation of artisan group to take stock of cane and bamboo artisan skills and also to study the existing market chain and product development opportunities;
- ii. Cane and bamboo resource assessment under Tsamang gewog;
- iii. Construction of semi-permanent cane and bamboo weaving center;
- iv. Procurement and supply of handicraft tools and equipments to the community group; and
- v. Providing of skill development training to the artisan group in the community.

Proposed work plan for cane & bamboo enterprise development

Sl. No	Activities	Time line	Remarks
1	Situation analysis with the Community group (Community consultation)	January 2023	
2	Cane and bamboo resource assessment	Jan & Feb 2023	
3	Enterprise group formation	Feb 2023	
4	Study visit and exposure trip for the local artisans to North-east Indian states	Oct-Nov, 2023	
	Market study for the products at local/regional and national level by the group/PNP	Dec, 2023	
5	Procurement and supply of handicraft tools and equipments	Oct-Nov, 2023	
6	Construction of semi-permanent cane and bamboo weaving center.	Jan-March, 2024	
7	Conduct training on design and product development as per market demand	April-June, 2024	
8	Support in delivery of products to market (one time)	May- June, 2024	

3.2 Creation of new plantation

a. Budget: Nu. 9,673,000

b. Timeline: January - December, 2023

SFED will facilitate for creation of new plantation with BFL fund under 5 different Parks and BC's during the 5th of the project implementation period namely JWS, S/Jongkhar, Tashigang, Tsirang Sarpang. The activity under taken will be the creation of normal plantation with a total area of 51.97 hectares within 7 different sites. All of the 51.97 hectares of plantation creation shall also be carried out within the 1st and 2nd quarter of the 5th year of the project ie; FY-2023 but the maintenance of the plantation shall continue to be implemented on annual basis till 2028 (5 subsequent years) for which the fund provisions has been secured from the BFL. The plantation creation site falls under different climatic and vegetation zones such as sub tropical hot and humid

d	2 nd weeding in the 2 nd year of creation											condition and growth of weeds
e	3 rd weeding in the 2 nd year of creation											

3.3 Maintenance of existing plantation

a. Budget: Nu. 785,000

b. Timeline: January - December, 2023

SFED will be facilitating implementation of plantation activities under BFL fund in different Parks and BC's during the 5th year of the project implementation period. The activity under taken will be maintenance of the already existing plantation with a total area of 39.47 hectares. The plantation maintenance area of 8.5 hectares under 5 different sites falls under sub tropical hot and humid climatic conditions along the southern border of the country and rest of the sites falls in the hot temperate forest. All of the 39.47 hectares maintenance shall be carried out within the 1st and 2nd quarter of the 5th year of the project ie; FY-2023.

The details of already existing plantation maintenance area as follows:

Sl.No	Dzongkhag/ Division	Location name	Gewog	Initial year of creation	Type of plantation	Total area(ha)
1	Dagana	Sibsooni	Lhamozingkha	2019-20	Bio-pesticide (Neem)	1.00
2	JWS	Jangsa	Lauri			2.00
3	Tsirang	Salari	Barshong			2.00
4	Sarpang	Malbans	Gakiling			2.00
5	Samtse	Nunai	Tashicholing			1.50
6	Tsirang	Rikey dangra	Tsirangtoe	2017-18	Enrichment	25.00
7	Wangdue	Jazipang	Ruebesa	2019-20	Normal pltn	3.00
8		Zomlinghang	Guma	2016	National Sig. plantation	2.00
9		Zomlingthang		2016		0.97
10		Thangzona		2016		
Total						39.47

3.4 Creation of habitat enrichment plantation

a. Budget: Nu. 4,320,000

b. Timeline: January - December, 2023

The SFED will facilitate for creation of new enrichment plantation with BFL fund under 4 different Parks and BC's during the 5th of the project implementation period namely PWS, RMNP, Pemagatsel and Thimphu. The activity under taken will be the creation of new enrichment plantation with a total area of 36.23 hectares in 10 different locations. All of the 36.23 hectares of enrichment plantation creation shall also be carried out in the 1st and 2nd quarter of the 5th year of the project ie; FY-2023 but the maintenance of the plantation shall continue to be implemented on annual basis till 2028 (5 subsequent years) for which the fund provisions has been assured from the BFL. The enrichment plantation creation site falls under different climatic and vegetation zones

such as sub tropical hot and humid climatic conditions in RMNP and PWS along the southern border of the country but cool temperate broadleaf vegetation for Pemagatsel and Cold temperate conifer zone for Thimphu.

The details of new enrichment plantation creation proposed for FY-2023 as follows:

Sl.No	Dzongkhag/ Division	Location name	Gewog	Total area(ha)
1	RMNP	Langkharkhola, Rejuk	Umling	6.11
		Citibrang, Gujong	Phangkhar	1.50
		Tshamkhang, Gomphu CF	Trong	1.00
		Lingsang, Sangtseri	Phangkhar	2.00
		Salapong	Phangkhar	0.80
		Tankikhola, Manas	Phangkhar	0.80
		Udigang, Changarzam	Phangkhar	2.02
2	PWS	Phibsoo Out-post	Sengey	10.00
3	Pemagatsel	Rinchenthang, Ngalam	Chokhorling	2.00
4	Thimphu	Below Tharda Gonpa (above lungtenphu)	Mewang	10.00
Total				36.23

4. Potential social and environmental impacts

4.1 Establishment of Cane and Bamboo Enterprise at Banjar

Following are some the possible common environmental and social impacts foreseen during the implementation of the proposed activities:

i. Environment Impacts:

- Construction waste generated
- Dust generation
- Noise pollution

ii. Social Impacts

- Worker's health and safety

4.2 Creation of new plantation

Following are some the possible common environmental and social impacts foreseen during the implementation of the proposed activities:

i. Environment Impacts:

- Generation of plastic wastes
- Introduction of invasive species

ii. Social Impacts

- Occupational health and safety of workers

4.3 Maintenance of existing plantation

Following are some the possible common environmental and social impacts foreseen during the implementation of the proposed activities:

i. Environment Impacts:

- Generation of plastic wastes and unwanted/damaged fences
- Introduction of invasive species

ii. Social Impacts

- Worker's health and safety

4.4 Creation of habitat enrichment plantation

Following are some the possible common environmental and social impacts foreseen during the implementation of the proposed activities:

i. Environment Impacts:

- Generation of plastic wastes
- Introduction of invasive species

ii. Social Impacts

- Occupational health and safety of workers

5. Mitigation Measures for Environmental and Social Impacts

Potential impacts to the environment and society along with the mitigating measures are listed below in the table:

Potential impact	Impact scale	Proposed mitigation measures	Responsible party	Cost
Activity 1: Establishment of cane and bamboo enterprise at Banjar village under Tsamang gewog				Nu. 3.5 M
1. Construction waste generated	Short term Minor	<p><i>Pre-construction:</i> requirements for appropriate waste management should be included in the bidding documents, as a precondition for the contractor's selection</p> <p><i>During construction:</i></p> <ul style="list-style-type: none"> • Identification of the different waste types at the project site (soil, asphalt, food, etc.); • Ensure that camps are located away from existing stream, river, or water sources, and that no discharge from camps is made into nearby water bodies; • Proper containers/waste bins should be provided at the project site; • Dumping of waste on the sides of the road, on private land, or in other non-designated places should be prohibited; 	BFL focal person in PNP, Site engineer, Community contractor engaged in construction. Site supervisor of the Community.	To be included in the bidding document

		<ul style="list-style-type: none"> • Dumping waste shall be prohibited on fragile slopes, forests, religious or other culturally sensitive areas or areas where livelihood is derived; • Collection, transportation and final disposal of all waste should be undertaken regularly; • All construction materials should be covered during the transportation to avoid waste dispersion; • The options for reuse/recycling of the generated waste streams should be taking into consideration (e.g. excavated soil, etc.); • Burning of construction waste should be prohibited. <p><i>After construction:</i> All waste shall be removed from the project site.</p>		
2. Dust generation	Short term Minor	<p>Pre-construction: requirements to limit emissions should be included in the bidding documents, as a precondition for the contractor's selection</p> <p>During construction:</p> <ul style="list-style-type: none"> • Construction site, transportation routes and materials handling sites should be water-sprayed on dry and windy days; • Construction materials should be stored in appropriate and covered places to minimize dust; • Before allowing vehicles on site, fitness and emission test of the vehicle shall be performed; • Vehicle loads likely to emit dust need to be covered; • Workers should wear protective masks if dust appears; • Vehicle speed should be restricted within the construction site; • Regular maintenance of the vehicles and construction machinery should be performed in order to reduce any leakages of motor oils, emissions and dispersion of pollution; and • Burning of debris from ground clearance shall be prohibited. 	BFL focal person in PNP, Site engineer, Community contractor engaged in construction. Site supervisor of the Community.	To be included in the bidding document

3. Noise pollution	Short term Minor	<p>Pre-construction: requirements to limit noise pollution should be included in the bidding documents, as a precondition for the contractor's selection</p> <p>During construction:</p> <ul style="list-style-type: none"> • Noise level control should be performed before the startup of construction activities; • The equipment should be fitted with appropriate noise devices that will reduce sound level; • The construction work should not be permitted during the nights, the operations on site shall be restricted to the hours 7am - 7pm; • Vehicles that are excessively noisy shall not be operated until corrective measures have been taken; and • Earplugs and protecting devices shall be provided to workers on site. 	BFL focal person in PNP, Site engineer, Community contractor engaged in construction, Site supervisor of the Community.	To be included in the bidding document
4. Workers' health and safety	Short term Minor	<ul style="list-style-type: none"> • Comply with the workers' health and safety guidelines; • Ensure regular health screening for the workers pre and during construction activities; • Ensure that no underage workers, or children are engaged; • Ensure decent work conditions, including an appropriate salary, working hours, accommodation and food for workers shall be provided to all workers; • Ensure that workers are employed on the principle of equal opportunity and fair treatment, and there is no discrimination with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices; • Implement a grievance mechanism for workers (and their organizations, 	Site engineer, Community contractor and Site supervisor of the Community.	To be included in the bidding document

		where they exist) to raise workplace concerns		
Activity 2: Creation of 51.97 hectares of new plantations in Samdrup Jongkhar (Chunurung, Orong and Fashipoktor, Lauri), Tsirang (Waklaytar, Sergithang), Trashigang (Yonphula, Kanglung) and Sarpang (Gelephu, Samtenling, Sarpang Tar)				Nu. 9.673 M
1. Waste generation of waste from the poly pot used for seedling	Short term Minor	<p>During Plantation:</p> <ul style="list-style-type: none"> • Proper containers/waste bins should be provided at the project site; • Dumping of waste on the sides of the road, on private land, or in other non-designated places should be prohibited; • Dumping waste shall be prohibited on fragile slopes, forests, religious or other culturally sensitive areas or areas where livelihood is derived; • Collection, transportation and final disposal of all waste should be undertaken immediately after the plantation; • All plantation materials should be covered during the transportation to avoid waste dispersion; and • Burning of waste should be prohibited. <p>After Plantation</p> <ul style="list-style-type: none"> • All waste shall be removed from the project site. 	<p>Green Bhutan Corporation Limited, Community contractors & Division/Park plantation focal persons</p> <p>Plantation workers</p>	To be part of worker agreement.
2. Risk of introducing invasive species	Long term Minor	<ul style="list-style-type: none"> • Assess appropriateness of species in terms of biodiversity, water efficiency, forest fire, local needs, cultural sensitivity, survival, etc; • Ensure that only native species are planted; • Regular weeding and control measures need to be carried out. Biological control measures (broadcasting desired species) need to be emphasized; and • Invasive species if grown at the site shall be uprooted and burned properly (without seed proliferation). 	<p>GBCL, Community contractors & Division/Park plantation focal persons</p>	
3. Workers' health and safety	Short term Minor	<ul style="list-style-type: none"> • Comply with the workers' health and safety guidelines; • Ensure regular health screening for the workers pre and during maintenance of the plantation; 	<p>GBCL, community contractors & Division/Park plantation focal persons</p>	To be part of worker agreement.

		<ul style="list-style-type: none"> • Ensure that no underage workers, or children are engaged; • Ensure decent work conditions, including an appropriate wage and salary, working hours, accommodation and food for workers shall be provided to all workers by the community contractors; • Ensure that workers are employed on the principle of equal opportunity and fair treatment, and there is no discrimination with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment; and • Provide workers with an incident report book and ensure that they are aware of the project's grievance redress mechanism and can use it to raise workplace concerns. 		
Activity 3: Maintenance of 39.47 hectares of old plantation 2.1 Maintenance of existing plantation in Tsirang (Ricky Dara, Tsirangtoe), Wangdue Phodrang (Jazipang, Ruebesa) and Punakha (Thangzona, Guma); and 2.2 Maintenance of existing neem plantation in Sarpang (Malbans, Gakidling), Dagana (Sibsooni, Lhamoizingkha), Samdrup Jongkhar (Jangsa, Lhangchenphu), Samtse (Nunja, Namgaycholing) and Tsirang (Salari, Barchong);				Nu.0.785 M
1. Waste generation of waste from the poly pot used for seedling	Short term Minor	During Plantation: <ul style="list-style-type: none"> • Proper containers/waste bins should be provided at the project site; • Dumping of waste on the sides of the road, on private land, or in other non-designated places should be prohibited; • Dumping waste shall be prohibited on fragile slopes, forests, religious or other culturally sensitive areas or areas where livelihood is derived; • Collection, transportation and final disposal of all waste should be undertaken immediately after the plantation; • All plantation materials should be covered during the transportation to avoid waste dispersion; and • Burning of waste should be prohibited. 	GBCL, Community contractors & Division/Park plantation focal persons Plantation workers	To be part of worker agreement.

		<p>After Plantation</p> <ul style="list-style-type: none"> All waste shall be removed from the project site. 		
2. Risk of introducing invasive species	Long term Minor	<ul style="list-style-type: none"> Assess appropriateness of species in terms of biodiversity, water efficiency, forest fire, local needs, cultural sensitivity, survival, etc; Ensure that only native species are planted; Regular weeding and control measures need to be carried out. Biological control measures (broadcasting desired species) need to be emphasized; and Invasive species if grown at the site shall be uprooted and burned properly (without seed proliferation). 	GBCL, Community contractors & Division/Park plantation focal persons	
3. Workers' health and safety	Short term Minor	<ul style="list-style-type: none"> Comply with the workers' health and safety guidelines; Ensure regular health screening for the workers pre and during maintenance of the plantation; Ensure that no underage workers, or children are engaged; Ensure decent work conditions, including an appropriate wage and salary, working hours, accommodation and food for workers shall be provided to all workers by the community contractors; Ensure that workers are employed on the principle of equal opportunity and fair treatment, and there is no discrimination with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment; and Provide workers with an incident report book and ensure that they are aware of the project's grievance redress mechanism and can use it to raise workplace concerns. 	GBCL, community contractors & Division/Park plantation focal persons	To be part of worker agreement.
Activity 4: Creation of 36.23 hectares of new enrichment plantation in Pema Gatshel (Rinchenthang, Nganglam), Zhemgang (Tshamkhang - Gomphu, Citibrang – Gujong,				Nu. 4.32 M

Salapong, Litshang, Tankikhola and Udigang -Phangkhar), Thimphu (Thadrag Geonpa) and Sarpang (Langerkhola, Umling).				
1. Waste generation of waste from the poly pot used for seedling	Short term Minor	<p>During Plantation:</p> <ul style="list-style-type: none"> • Proper containers/waste bins should be provided at the project site; • Dumping of waste on the sides of the road, on private land, or in other non-designated places should be prohibited; • Dumping waste shall be prohibited on fragile slopes, forests, religious or other culturally sensitive areas or areas where livelihood is derived; • Collection, transportation and final disposal of all waste should be undertaken immediately after the plantation; • All plantation materials should be covered during the transportation to avoid waste dispersion; and • Burning of waste should be prohibited. <p>After Plantation</p> <ul style="list-style-type: none"> • All waste shall be removed from the project site. 	<p>GBCL, Community contractors & Division/Park plantation focal persons</p> <p>Plantation workers</p>	To be part of worker agreement.
2. Risk of introducing invasive species	Long term Minor	<ul style="list-style-type: none"> • Assess appropriateness of species in terms of biodiversity, water efficiency, forest fire, local needs, cultural sensitivity, survival, etc; • Ensure that only native species are planted; • Regular weeding and control measures need to be carried out. Biological control measures (broadcasting desired species) need to be emphasized; and • Invasive species if grown at the site shall be uprooted and burned properly (without seed proliferation). 	<p>GBCL, Community contractors & Division/Park plantation focal persons</p>	
3. Workers' health and safety	Short term Minor	<ul style="list-style-type: none"> • Comply with the workers' health and safety guidelines; • Ensure regular health screening for the workers pre and during maintenance of the plantation; • Ensure that no underage workers, or children are engaged; • Ensure decent work conditions, including an appropriate wage and 	<p>GBCL, community contractors & Division/Park plantation focal persons</p>	To be part of worker agreement.

		<p>salary, working hours, accommodation and food for workers shall be provided to all workers by the community contractors;</p> <ul style="list-style-type: none"> • Ensure that workers are employed on the principle of equal opportunity and fair treatment, and there is no discrimination with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment; and • Provide workers with an incident report book and ensure that they are aware of the project’s grievance redress mechanism and can use it to raise workplace concerns. 		
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6. ESMP Implementation arrangements

The implementation of all the plantation creation and maintenance activities will be carried out by the implementing agency; Green Bhutan Corporation Limited (GBCL), a State owned Enterprise (SOE) based on the MOU signed between GBCL and the Department of Forest and Park Services (DoFPS) in collaboration and under the regular supervision of the plantation focal person from the respective Field Divisions/Parks. However, the BFL plantation focal person in SFED shall be responsible for facilitation in terms of providing technical support and processing of budget releases on time for the implementation of activity in the field. The field implementers and plantation focal persons shall be responsible for compliance of all the procedures outlined in the ESMP. Therefore, the ESMP shall be part of the contract agreement signed between the DoFPS and GBCL for implementation of the planned activities prescribed in the ESMP for the FY-2023-24.

GBCL is obligated to perform all proposed preventive or mitigation environmental and social measures in this plan and to keep the evidence of any documents related to applying these measures. The plantation focal persons of the respective Divisions/Parks should monitor the implementation of proposed measures. Non compliance should be recorded and reported to the ESS consultants immediately, and the ESS consultants will report it to the PCU (M&E).

Disbursement of project funds to the contractors will be contingent upon their full compliance with the requirements.

7. ESMP monitoring arrangements

The Plantation (BFL) focal persons of the respective Divisions/Parks will closely monitor the implementation of plantation creation and maintenance works at their specific sites to ensure that they fully comply with this ESMP and is as per the technical and administrative approval accorded by the DoFPS. The overall monitoring will be carried out by the ESS officer, PCU to ensure that

there is no deviation from ESMP prescriptions. The monitoring of activities under this ESMP will be carried out in the following manner:

Sl. No	Dzongkhag /Division/ Park	Monitoring team	Timeline		Location	Means of Verification
			Start	Complete		
1	PNP	Field focal	January 2024	June 2024	Banjar, Tsamang	Field visit/reports
		PCU	May 2024	May 2024		Field visit/reports
		BFLFS	July 2024	July 2024		Reports
2	Dagana	Field focal	March 2023	June 2023	Sibsooni, Lhamozingkha	Field visit/reports
		PCU	July 2023	July 2023		Reports
		BFLFS	July 2023	July 2023		Reports
3	JWS	Field focal	March 2023	June 2023	Jangsa & Lauri	Field visit/reports
		PCU	July 2023 January 2024	July 2023 January 2024		Reports
		BFLFS	July 2023 January 2024	July 2023 January 2024		Reports
4	Tsirang	Field focal	March 2023	June 2023	Sallari & Wakleytar	Field visit/reports
		PCU	July 2023 January 2024	July 2023 January 2024		Reports
		BFLFS	July 2023 January 2024	July 2023 January 2024		Reports
5	Sarpang	Field focals	March 2023	June 2023	Malbans, Gelephu, Samtenling & Shompangkha	Field visit/reports
		PCU	July 2023 January 2024	July 2023 January 2024		Reports
		BFLFS	July 2023 January 2024	July 2023 January 2024		Reports
6	Samtse	Field focals	March 2023	June 2023	Nunai	Field visit/reports
		PCU	July 2023	July 2023		Reports
		BFLFS	July 2023	July 2023		Reports
7.	S/Jongkhar	Field focals	March 2023	June 2023	Fremi-phu	Field visit/reports
		PCU	July 2023 January 2024	July 2023 January 2024		Reports
		BFLFS	July 2023 January 2024	July 2023 January 2024		Reports
8	Tashigang	Field focal	March 2023	June 2023	Yonphula	Field visit/reports
		PCU	July 2023 January 2024	July 2023 January 2024		Reports
		BFLFS	July 2023 January 2024	July 2023 January 2024		Reports
9	Pemagatsel	Field focal	March 2023	June 2023	Rinchenthang	Field visit/reports
		PCU	July 2023	July 2023		Reports
		BFLFS	July 2023	July 2023		Reports
10	Thimphu	Field focal	March 2023	June 2023	Tharda gonpa	Field visit/reports
		PCU	July 2023	July 2023		Reports

		BFLFS	July 2023	July 2023		Reports
11	RMNP	Field focal	March 2023	June 2023	Langkharkhola-Rejuk, Citibrang-Gujong, Tshamkhang-Gomphu , CF, Lingsang-Sangtseri, Salapong, Tankikhola, Manas	Field visit/reports
		PCU	July 2023	July 2023		Reports
		BFLFS	July 2023	July 2023		Reports
12	PWS	Field focal	March 2023	June 2023	Phibsoo Outpost	Field visit/reports
		PCU	July 2023	July 2023		Reports
		BFLFS	July 2023	July 2023		Reports
13	Wangdue	Field focal	March 2023	June 2023	Jazipang, Thangzona & Zomlingthang	Field visit/reports
		PCU	July 2023	July 2023		Reports
		BFLFS	July 2023	July 2023		Reports

Monitoring by ESS Focal officer at PCU:

- Monitoring through photographic/video evidence submitted by the IAs during the implementation as per the given dateline in the table above;
- Reports by ESS officer to BFL Fund Secretariat - Semi-annual report submitted to the BFL Fund Secretariat in July, 2023, January 2024 and July 2024; and
- Bi-annual reports of the Secretariat to WWF US (as part of mid-year and final Annual Performance Reports).

8. Capacity Need and Budget

The activities under this ESMP will be implemented by the BFL focal person, Division/Park plantation focal persons, Green Bhutan Corporation Limited and contractors that will employ workers as mentioned in the contract agreement. The detail activities with budget allocations as tabulated below:

Sl. No.	Activity	Amount (Nu.)	Budget for ESS mitigation
1	Cane and Bamboo enterprise development	3,500,000	To be met from activity cost
2	Creation of new plantation	9,673,000	To be met from activity cost
3	Maintenance of existing plantations	785,000	To be met from activity cost
4	Creation of habitat enrichment plantations	4,320,000	To be met from activity cost
Total		18,278,000	

The proposed activities are of very small scale and there are no adverse social and environmental impacts which require mitigation measures. Therefore, separate fund for mitigation measures is not proposed.

9. Consultation and Disclosure Mechanisms

The public consultation shall be organized by the respective Field Divisions/Parks in collaboration with the implementing agency (GBCL) to convince the local public and incorporate their views and recommendations in deciding the choice of species to be planted, types of protection measures (fencing materials) to be used and alternatives to cattle grazing option if any etc. However, public consultation shall not be required for carrying out maintenance of old plantation sites and maintenance of the newly created plantation sites in the subsequent years.

The full English version of this ESMP, as well as an executive summary in Bhutanese, shall be disclosed/uploaded on the website of MoENR, BFL and WWF. The hard copies of the ESMP would be made available at the FRPMD, GBCL and at the PCU Office.

10. Stakeholder engagement plan

The separate stakeholder engagement plan as such shall not be required as both the new creation of plantation as well as the maintenance of the old plantations shall be implemented through authorized agency (GBCL). However, the actual field work shall be mostly executed through engagement of community contractors and local laborers in the process.

Annexure 1

BFL: Suggested Occupational Health and Safety Standards

Employers and supervisors are obliged to implement all reasonable precautions to protect the health and safety of workers. Implementing entities should hire contractors that have the technical capability to manage the occupational health and safety issues of their workers, extending the application of the hazard management activities through formal procurement agreements.

This section provides guidance and examples of reasonable precautions to implement in managing principal risks to occupational health and safety. It is based on the IFC's Environmental, Health, and Safety Guidelines (April 30, 2007) and the Occupational Health and Safety Guidelines of Bhutan's Construction Development Corporation Ltd., which relies on the national Regulation on Occupational Health, Safety and Welfare 2012, Regulation on Working Conditions 2012 and Labour Act 2007, and in compliance to Sl. No. 21 of Regulation on Occupational Health, Safety and Welfare 2012.

1. General Facility Design and Operation

Integrity of Workplace Structures

Permanent and recurrent places of work should be designed and equipped to protect occupational health and safety:

- Surfaces, structures and installations should be easy to clean and maintain, and not allow for accumulation of hazardous compounds.
- Buildings should be structurally safe, provide appropriate protection against the climate, and have acceptable light and noise conditions.
- Fire resistant, noise-absorbing materials should, to the extent feasible, be used for cladding on ceilings and walls.
- Floors should be level, even, and non-skid.
- Heavy oscillating, rotating or alternating equipment should be located in dedicated buildings or structurally isolated sections.

Severe Weather and Facility Shutdown

- Workplace structures should be designed and constructed to withstand the expected elements for the region and have an area designated for safe refuge (e.g., in case of earthquake).

Workspace and Exit

- The space provided for each worker, and in total, should be adequate for safe execution of all activities, including transport and interim storage of materials and products.

Fire Precautions

The workplace should be designed to prevent the start of fires through the implementation of fire codes applicable to industrial settings. Other essential measures include:

- The workplace shall be provided with adequate means of protection and escape in case of fire.
- The workplace shall be provided with adequate number of relevant fire extinguishers.

- Workers shall wear shoes without iron or steel nails or any other exposed ferrous materials which is likely to cause sparks by friction.
- Smoking, lightening, or carrying of matches, lighters or smoking materials shall be prohibited.
- All other precautions, as are reasonably practicable, shall be taken to prevent initiation of ignition from all other possible sources such as open flames, frictional sparks, overheated surfaces of machinery or plant, chemical or physical, chemical reaction and radiant heat.
- At every workplace adequate provision of water supply for firefighting shall be provided and maintained.
- Equipping facilities with firefighting equipment (e.g., fire extinguishing bottle). The equipment should be maintained in good working order and be readily accessible. It should be adequate for the dimensions and use of the premises, equipment installed, physical and chemical properties of substances present, and the maximum number of people present.
- Manual firefighting equipment shall be easily accessible and simple to use.
- Fire extinguishers and emergency alarm systems that are both audible and visible should be in place.

Lavatories and Showers

- Adequate lavatory facilities (toilets and washing areas) should be provided for the number of people expected to work in the facility (at least one for every 20 workers). Toilet facilities should also be provided with adequate supplies of hot and cold running water and soap.

Potable Water Supply

- Adequate supplies of potable drinking water should be provided to workers at the work site.

Clean Eating Area

- Where there is potential for exposure to substances poisonous by ingestion, suitable arrangements are to be made for provision of clean eating areas where workers are not exposed to the hazardous or noxious substances.

Lighting

- Workplaces should, to the degree feasible, receive natural light and be supplemented with sufficient artificial illumination to promote workers' safety and health, and enable safe equipment operation. Supplemental 'task lighting' may be required where specific visual acuity requirements should be met.
- Emergency lighting of adequate intensity should be installed upon failure of the principal artificial light source to ensure safe shut-down, evacuation, etc.

Safe Access

- Passageways for pedestrians and vehicles within and outside buildings should be segregated and provide for easy, safe, and appropriate access.
- Equipment and installations requiring servicing, inspection, and/or cleaning should have unobstructed, unrestricted, and ready access.
- Covers should, if feasible, be installed to protect against falling items.
- Measures to prevent unauthorized access to dangerous areas should be in place.

First Aid

- The employer should ensure that qualified first-aid can be provided at all times. A sufficient number of first aid boxes or cupboards shall be provided and maintained so as to be readily available during all working hours, provided that the distance of the nearest first aid box or a cupboard shall be not more than 200m from any working place.
- First aid kits include all equipment outlined in Annex 1 to these Guidelines.
- Remote sites should have written emergency procedures in place for dealing with cases of trauma or serious illness up to the point at which patient care can be transferred to an appropriate medical facility.

Work Uniform

- The contractor shall provide a working uniform to each worker.
- All workers shall be required to attend the duty in proper uniform unless otherwise instructed by the Contractor.

Air Supply

- Sufficient fresh air should be supplied for indoor and confined workspaces. Factors to be considered in ventilation design include physical activity, substances in use, and process related emissions. Air distribution systems should be designed so as not to expose workers to draughts.
- Re-circulation of contaminated air is not acceptable. Heating, ventilation and air conditioning (HVAC) systems should be equipped, maintained and operated so as to prevent growth and spreading of disease agents (e.g. Legionella pneumophila) or breeding of vectors (e.g. mosquitoes and flies) of public health concern.

2. Information Provision on Occupational Health and Safety (OHS)

- The Contractor is responsible to hold an information session to familiarize all workers with the OHS procedures specified in these guidelines, in order to ensure they are apprised of the basic site rules of work at / on the site and of personal protection and preventing injury to fellow workers.
- The information session should consist of basic hazard awareness, site-specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate. Any site-specific hazard or color coding in use should be thoroughly reviewed as part of orientation training.

3. Physical Hazards

- Physical hazards represent potential for accident or injury or illness due to repetitive exposure to mechanical action or work activity.

Rotating and Moving Equipment

Injury or death can occur from being trapped, entangled, or struck by machinery parts due to unexpected starting of equipment or unobvious movement during operations. Recommended protective measures include:

- Designing machines to eliminate trap hazards and ensuring that extremities are kept out of harm's way under normal operating conditions. Examples of proper design considerations include two-hand operated machines to prevent amputations or the availability of emergency stops dedicated to the machine and placed in strategic locations.

- Where a machine or equipment has an exposed moving part or exposed pinch point that may endanger the safety of any worker, the machine or equipment should be equipped with, and protected by, a guard or other device that prevents access to the moving part or pinch point. Guards should be designed and installed in conformance with appropriate machine safety standards.

Noise

- No worker should be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. In addition, no unprotected ear should be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C).
- The use of hearing protection should be enforced actively when the equivalent sound level over 8 hours reaches 85 dB(A), the peak sound levels reach 140 dB(C), or the average maximum sound level reaches 110dB(A). Hearing protective devices provided should be capable of reducing sound levels at the ear to at least 85 dB(A).
- Although hearing protection is preferred for any period of noise exposure in excess of 85 dB(A), an equivalent level of protection can be obtained, but less easily managed, by limiting the duration of noise exposure. For every 3 dB(A) increase in sound levels, the ‘allowed’ exposure period or duration should be reduced by 50 percent.
- Prior to the issuance of hearing protective devices as the final control mechanism, use of acoustic insulating materials, isolation of the noise source, and other engineering controls should be investigated and implemented, where feasible.
- Periodic medical hearing checks should be performed on workers exposed to high noise levels.

Vibration

Exposure to hand-arm vibration from equipment such as hand and power tools, or whole-body vibrations from surfaces on which the worker stands or sits, should be controlled through choice of equipment, installation of vibration dampening pads or devices, and limiting the duration of exposure.

Electrical

Exposed or faulty electrical devices, such as circuit breakers, panels, cables, cords and hand tools, can pose a serious risk to workers. Overhead wires can be struck by metal devices, such as poles or ladders, and by vehicles with metal booms. Vehicles or grounded metal objects brought into close proximity with overhead wires can result in arcing between the wires and the object, without actual contact. Recommended actions include:

- Marking all energized electrical devices and lines with warning signs
- Locking out (de-charging and leaving open with a controlled locking device) and tagging-out (warning sign placed on the lock) devices during service or maintenance
- Checking all electrical cords, cables, and hand power tools for frayed or exposed cords and following manufacturer recommendations for maximum permitted operating voltage of the portable hand tools
- Double insulating / grounding all electrical equipment used in environments that are, or may become, wet; using equipment with ground fault interrupter (GFI) protected circuits
- Protecting power cords and extension cords against damage from traffic by shielding or suspending above traffic areas

- Appropriate labeling of service rooms housing high voltage equipment ('electrical hazard') and where entry is controlled or prohibited
- Establishing "No Approach" zones around or under high voltage power lines
- Rubber tired construction or other vehicles that come into direct contact with, or arcing between, high voltage wires may need to be taken out of service for periods of 48 hours and have the tires replaced to prevent catastrophic tire and wheel assembly failure, potentially causing serious injury or death
- Conducting detailed identification and marking of all buried electrical wiring prior to any excavation work

Eye Hazards

Solid particles from a wide variety of industrial operations, and/or a liquid chemical spray may strike a worker in the eye causing an eye injury or permanent blindness. Recommended measures include:

- Use of machine guards or splash shields and/or face and eye protection devices, such as safety glasses with side shields, goggles, and/or a full-face shield. Frequent checks of these types of equipment prior to use to ensure mechanical integrity is also good practice.
- Where machine or work fragments could present a hazard to transient workers or passers-by, extra area guarding or proximity restricting systems should be implemented, or PPE required for transients and visitors.
- Provisions should be made for persons who have to wear prescription glasses either through the use of overglasses or prescription hardened glasses.

Welding / Hot Work

Welding creates an extremely bright and intense light that may seriously injure a worker's eyesight. In extreme cases, blindness may result. Additionally, welding may produce noxious fumes to which prolonged exposure can cause serious chronic diseases. Recommended measures include:

- Provision of proper eye protection such as welder goggles and/or a full-face eye shield for all personnel involved in, or assisting, welding operations. Additional methods may include the use of welding barrier screens around the specific work station (a solid piece of light metal, canvas, or plywood designed to block welding light from others). Devices to extract and remove noxious fumes at the source may also be required.

Working Environment Temperature

Exposure to hot or cold working conditions in indoor or outdoor environments can result in temperature stress-related injury or death. Use of personal protective equipment (PPE) to protect against other occupational hazards can accentuate and aggravate heat-related illnesses. Extreme temperatures in permanent work environments should be avoided through implementation of engineering controls and ventilation. Where this is not possible, such as during short-term outdoor work, temperature-related stress management procedures should be implemented which include:

- Monitoring weather forecasts for outdoor work to provide advance warning of extreme weather and scheduling work accordingly
- Providing temporary shelters to protect against the elements during working activities or for use as rest areas
- Use of protective clothing
- Providing easy access to adequate hydration such as drinking water or electrolyte drinks, and avoiding consumption of alcoholic beverages

Ergonomics, Repetitive Motion, Manual Handling

Injuries due to ergonomic factors, such as repetitive motion, overexertion, and manual handling, take prolonged and repeated exposures to develop, and typically require periods of weeks to months for recovery. These OHS problems should be minimized or eliminated to maintain a productive workplace. Controls may include:

- Facility and workstation design with 5th to 95th percentile operational and maintenance workers in mind
- Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools and work objects, and requiring multi-person lifts if weights exceed thresholds
- Selecting and designing tools that reduce force requirements and holding times, and improve postures
- Incorporating rest and stretch breaks into work processes, and conducting job rotation
- Implementing quality control and maintenance programs that reduce unnecessary forces and exertions

Working at Heights

Fall prevention and protection measures should be implemented whenever a worker is exposed to the hazard of falling more than two meters; into operating machinery; into water or other liquid; into hazardous substances; or through an opening in a work surface. Fall prevention / protection measures may also be warranted on a case-specific basis when there are risks of falling from lesser heights. Fall prevention may include:

- Installation of guardrails with mid-rails and toe boards at the edge of any fall hazard area
- Proper use of ladders and scaffolds by trained workers
- Use of fall prevention devices, including safety belt and lanyard travel limiting devices to prevent access to fall hazard area, or fall protection devices such as full body harnesses used in conjunction with shock absorbing lanyards or self-retracting inertial fall arrest devices attached to fixed anchor point or horizontal life-lines
- Appropriate training in use, serviceability, and integrity of the necessary PPE
- Inclusion of rescue and/or recovery plans, and equipment to respond to workers after an arrested fall

Illumination

Work area light intensity should be adequate for the general purpose of the location and type of activity, and should be supplemented with dedicated work station illumination, as needed. Controls should include:

- Use of energy efficient light sources with minimum heat emission
- Undertaking measures to eliminate glare / reflections and flickering of lights
- Taking precautions to minimize and control optical radiation including direct sunlight.
- Exposure to high intensity UV and IR radiation and high intensity visible light should also be controlled
- Controlling laser hazards in accordance with equipment specifications, certifications, and recognized safety standards. The lowest feasible class Laser should be applied to minimize risks.

4. Personal safety equipment for workers

All workers are equipped with the following personal safety equipment: helmet, gloves, ordinary boots and reflective vest.

Workers that are exposed to dust should also be provided with eye protection glasses and face mask. Workers that are exposed to noise should be provided with ear plugs. Workers that need to work in the dark should be provided with hand and cap lamps. Workers are instructed regarding safety equipment as follows:

- Always wear complete set of protective wear.
- Do not wear loose clothing, such as overhang shirt, jackets, mufflers etc.
- Tuck shirt and jacket well.
- Secure helmet with belt under the chin.
- Tuck the bottom sleeves of trouser inside safety boot.
- Dress with reflector

5. Standards for workers' accommodation

1. General living facilities

- The location of the facilities is designed to avoid flooding or other natural hazards
- The living facilities are located within a reasonable distance from the worksite.
- Transport is provided to worksite safe and free.
- The living facilities are built using adequate materials, kept in good repair and kept clean and free from rubbish and other refuse.

2. Drainage

- The site is adequately drained.

3. Heating, air conditioning, ventilation and light

- Living facilities are provided with adequate heating, ventilation, and light systems including emergency lighting.

4. Water

- Workers have easy access to a supply of clean/ potable water in adequate quantities.
- The quality of the water complies with national/local requirements or WHO standards.
- Tanks used for the storage of drinking water are constructed and covered to prevent water stored therein from becoming polluted or contaminated.
- The quality of the drinking water is regularly monitored.

5. Wastewater and solid waste

- Wastewater, sewage, food and any other waste materials are adequately discharged in compliance with national and/or international standards and without causing any significant impacts on camp residents, the environment or surrounding communities.
- Specific containers for rubbish collection are provided and emptied on a regular basis.
- Pest extermination, vector control and disinfection are undertaken throughout the living facilities at least once.

6. Rooms/dormitories facilities

- Rooms/dormitories are kept in good condition.
- Rooms/dormitories are aired and cleaned at regular intervals.
- Rooms/dormitories are built with easily cleanable flooring material.
- Rooms/dormitories and sanitary facilities are located in the same buildings.

- Residents are provided with enough space.
- The number of workers sharing the same room/dormitory is minimized.
- Doors and windows are lockable and provided with mosquito screens when necessary.
- Mobile partitions or curtains are provided.
- Adequate number of furniture such as table, chair, mirror, and lamps are provided for all workers.
- Separate sleeping areas are provided for men and women.

7. Bed arrangements and storage facilities

- A separate bed is provided for every worker.
- The practice of “hot-bedding” is prohibited.
- There is a minimum space of 1 meter between beds.
- The use of double deck bunks is minimized.
- If double deck bunks are in use, there is enough clear space between the lower and upper bunk of the bed.
- Workers are provided with comfortable mattresses. Workers may be expected to use their own pillows and bed linens.
- Workers wash bed linen frequently and applied with adequate repellents and disinfectants (where conditions warrant).
- Adequate facilities for the storage of personal belongings are provided.
- Separate storages for work clothes and PPE and depending on condition, drying/airing areas are provided.

8. Sanitary and toilet facilities

- Sanitary and toilet facilities are constructed from materials that are easily cleanable.
- Sanitary and toilet facilities are cleaned frequently and kept in working condition.
- Toilets, showers/bathrooms and other sanitary facilities are designed to provide workers with adequate privacy including ceiling to floor partitions and lockable doors.
- Separate sanitary and toilet facilities are provided for men and women.
- Toilet facilities are conveniently located and easily accessible.
- Toilet facilities are environmentally friendly (e.g., pit toilet) and sewage is not disposed into the worksite.
- Open defecation in the vicinity of project sites should be prohibited.
- An adequate number of hand wash basins and showers/bathrooms facilities are provided.
- Shower facilities are provided with water heating facilities.

9. Cooking and laundry facilities

Cooking and laundry facilities should be available for workers at the worksite or in close vicinity to it. These facilities should be kept in clean and sanitary conditions.

10. Leisure, social and telecommunications facilities

- Basic social collective spaces should be available to workers.
- Workers are provided with dedicated places for religious observance, as appropriate.
- The employer provides workers with local sim cards that can be used for communication on their personal cell phones.

Contents of first aid box or cup-boards

The first aid boxes or cup-boards shall be distinctively marked with white cross on a green background and shall contain the following equipment:

1. Small sterilized dressings (12)
2. Medium size sterilized dressings (6)
3. Large size sterilized dressings (6)
4. Large size sterilized burn dressings (6)
5. (1/2 oz.) Sterilized cotton wool (6 packets)
6. (2oz.) Bottle containing a two per cent alcoholic solution of iodine (1)
7. (2oz.) Bottle containing Betadine (antiseptic solution) having the dose and mode of administration indicated on the label (1)
8. Roll of adhesive plaster (1)
9. A snake bite lancet (1)
10. Torch light (1)
11. Pair of scissors (1)
12. Tablets Aspirin (5gms) 2 dozen
13. Burn Ointment (2 tubes)
14. Dettol (2 phial, about 2 ozs)
15. Bandages 4 inches wide
16. Bandages 2 inches wide
17. Triangular bandages (2)
18. Packets of safety pins (1)
19. A supply of suitable splint