Bhutan for Life

Environmental and Social Management Plan for Sakteng Wildlife Sanctuary (2021)

1. Introduction

(A) Project Background

The Bhutan for Life (BFL) project aims to ensure a robust network of protected areas and biological corridors that secures human well-being, biodiversity conservation and increase climate resilience in Bhutan. The project provides a 14-year financial bridge that allows for immediate improvement in the management of Bhutan's protected areas for climate resilience, and the prompt delivery of mitigation, adaptation and biodiversity gains, while the country gradually ratchets 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 and 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;
- 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.

(B) Scope of ESMP

The preparation of this Environmental and Social Management Plan (ESMP) was required in order to manage the environmental and social impacts through and specific mitigation actions required to implement the project 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 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 Sakteng Wildlife Sanctuary (SWS) and the contractor to be commissioned by SWS for the project.

(C) 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;
- Ensuring that all stakeholders are engaged in the project activities' preparation and implementation, and their concerns are fully addressed.

(D) Applicable law, policies, and regulation

This ESMP is developed by following the guidelines as set forth in the 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).
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; as well as general standards on occupational and community health and safety and on 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. With regard to environmental impacts, there are no direct contradictions between the RGoB laws and regulations and the WWF's SIPP, but the requirements of the latter are more extensive. All project activities should fully comply both with the RGoB's Regulations on the Environmental Clearance of Projects, and with the procedures and mitigation measures prescribed in this ESMF. In case that the WWF's SIPP requirements are more extensive, strict, or detailed than the RGoB legislation and policies, the former will apply to all project activities.
With regard to social impacts, the primary discrepancies between the RGoB laws and regulations and the WWF's SIPP refer to the status of non-title holders and informal land use, and the commitment to participatory decision-making processes. 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 as part of the development of various safeguards documents and during project activities. RGoB legislation does not include similar requirements. For the purposes 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:

The Sakteng Wildlife Sanctuary (SWS) is located in between the latitudes of 27º09'00"-27º28'08" North and longitudes of 91º47'04"- 92º07'02" East. It has an area of 740.60 sq. km. It was established in 2003 representing the easternmost temperate and alpine ecosystems of Bhutan. It borders with the Indian State of Arunachal Pradesh in north and east, Phongmey Gewog under Trashigang Dzongkhag in the west and Lauri Gewog, Samdrup Jongkhar in south. The Sanctuary is connected to Jomotshangkha Wildlife Sanctuary (JWS) by a biological corridor in the south forming a part of Bhutan Biological Conservation Complex (B2C2).
SWS cover about 100% of Sakteng Gewog and 64.68% of Merak Gewog (Figure 1). However, for faster public service delivery and to save administrative cost, SWS management provides forestry services to the remaining villages/settlements/seasonal grazing ground of Merak Gewog falling outside the Sanctuary area like Sheytami, Drana, Chipling (seasonal grazing area), Kashateng village and network of seasonal grazing land spread over entire Gewog. In ground, the SWS manage the entire Gewogs of Merak and Sakteng covering a total of 902 km2.
SWS represents eastern Himalayan temperate ecosystem which harbours numbers of globally threatened and endangered species like the Royal Bengal Tiger (*Panthera tigris*), Red Panda (*Ailurus fulgens*), Musk Deer (*Moschus sp*.) Capped Langur (*Trachypithecus pileatu*), Himalayan Black Bear (*Ursus thibetanus laniger*), Himalayan Serow (*Capricornis thar*) etc.

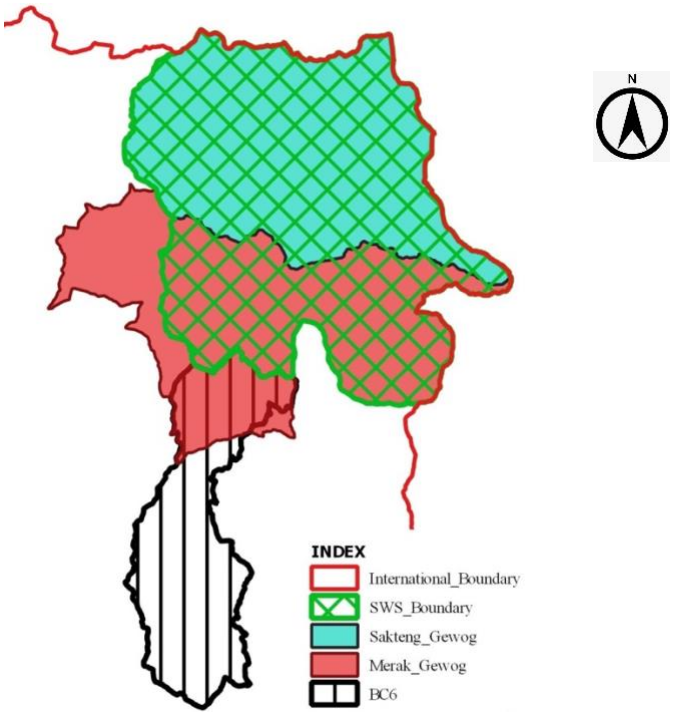


Figure 1: SWS boundary connected by BC6

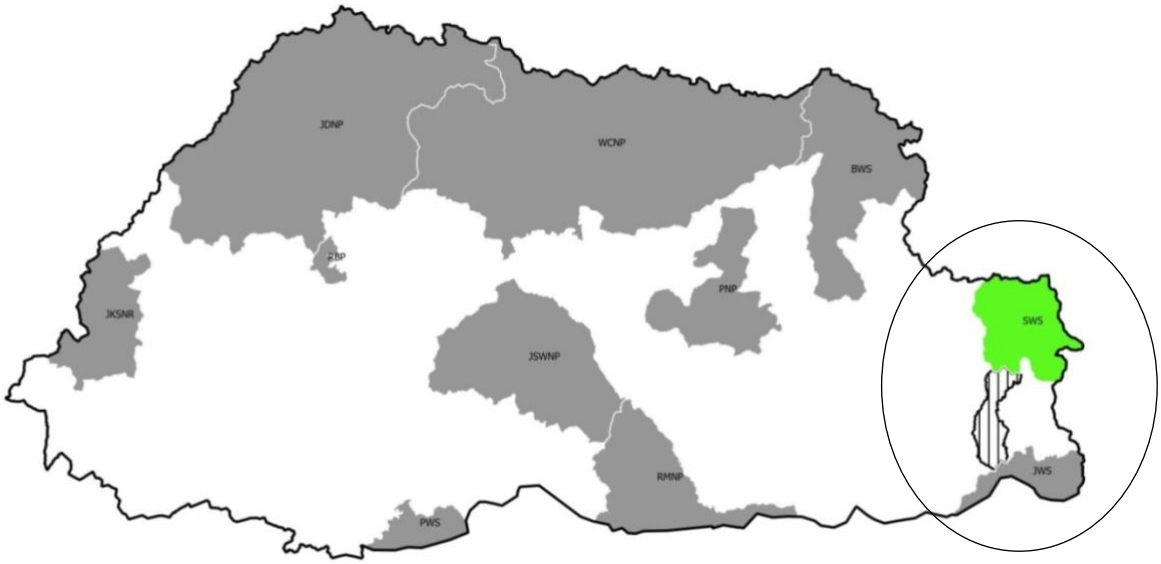


Figure 2: SWS and JWS connected by BC6

Home to diverse flora and fauna, it has a number of outstanding universal values that qualifies SWS as a mixed World Heritage Site and has made to the tentative list of UNESCO world heritage site in 2013.

The Sanctuary can be categorized into three climatic zones – subtropical, temperate and alpine zone. Altitude ranges from 1500-4500m with sub-tropical climate in the low-lying valleys to alpine meadows in the higher mountains. The majority of the SWS fall under temperate zone. The temperate climatic condition is characterized by cold winters and warm summers with occasional heavy rainfall. Area receives highest rainfall during the month of June, July and August with sporadic rainfall throughout late April to early October, especially during late afternoon. Snowfall occurs from mid-October till early April. The Sanctuary harbors numerous streams and alpine lakes forming head waters of major river systems of the country for production of clean hydropower energy for increased revenue generation. Three river systems – Gam-ri, Mera-ama-ri and Jomo-ri originate from the Sanctuary. 100% encounter of pollution sensitive macro-invertebrates like Stonefly, Caddishfly and Mayfly, and overall biotic index of these rivers (3.04) establishes the purity of these rivers.

SWS also have maximum number of Rhododendron species with 41 out of 46 Rhododendron species recorded in the country. In total, 858 plants, 39 mammals, 283 birds, 63 butterflies, 5 reptiles, 3 amphibians, and 2 fish species were recorded in Sanctuary area so far.

"*Brokpas*" the semi-nomadic highlanders with unique culture and traditions are the inhabitants of the Sanctuary. The Sanctuary is home to about 5000 *Brokpas* of Merak and Sakteng largely dependent on livestock rearing as a source of livelihood sustenance. Eighty-three percent of the household income is generated from the livestock husbandry. Of 772 households (HH) in 13 villages under Merak and Sakteng Gewog, 85% (567 HH) depends on livestock farming. Very few people living in the lower areas (below 2500m altitude) depend on subsistence farming.

3. Planned activities in Year 2021

1. Restoration/Improvement of alpine meadows

Major forces exerting degradation in alpine meadows of SWS are overgrazing and erratic climatic conditions (climate change). Steady encroachment of Rhododendron and Juniper

krummholz, and growth of unpalatable herbs and shrubs is common sign of degradation in these areas which is further escalated by soil erosion.
Degradation of alpine meadows adversely influences the population and productivity of herbivores both wild and domestic. Community of Merak and Sakteng are pastoralist semi-nomadic tribe totally dependent on natural grass for livestock (Yak, Dzo-Dzom, local cattle and sheep) grazing. As the quality of alpine meadows decline productivity of livestock decline too. To compensate low livestock production people use to increases their livestock population thereby compounding pressure on already degraded meadows. Hence, restoration/improvement of alpine meadows is immediate solution to sustain healthy population of herbivore in alpine meadows of SWS.
From Nu. 0.45 million allocated for the activity 20 hectares of degraded alpine meadows is proposed to restore/improve in Merak and Sakteng during the month of May and June 2021. Local herders (about 5 people per ha.) is planned to involve in cutting, uprooting and debranching of unpalatable shrubs and herbs. Except for seasonal herders hut no permanent settle exist near the working site.
Potential social and environmental impacts of the activity are:

1. Workers health and safety,
2. Waste generated by worker and
3. Soil erosion from exposed soil along steep slopes

2. Improvement/restoration of grassland

Grassland provides vital ecological services viz. reduce soil erosion, water quality and infiltration, maintain global carbon and hydrological cycle, and scenic beauty. Being main forage resources for livestock, grassland are important asset for the people of Merak and Sakteng. Growth of unpalatable herbs and shrubs species due to excessive grazing is major problem affecting livestock production capacity. This might also hampering herbivore population of SWS.
Nu. 650,000.00 is proposed for restoration/improvement of grassland. From the proposed fund about 30 hectares of degraded grassland shall be restore/improve in Merak and Sakteng. Local herders (about 5 people per ha.) is planned to involve in cutting, uprooting and debranching of unpalatable shrubs and herbs. Except for seasonal herders hut no permanent settle exist near the working site.
Potential social and environmental impacts of the activity are:

1. Workers health and safety,
2. Waste generated by worker,
3. Soil erosion from exposed soil along steep slopes

3 River Bank Protection

Keyjurong stream flows between Sakteng and Tengma village. As depicted in picture 3 below these two villages are much closed to Keyjurong stream bank posing immediate threat of flash flood. There are more than at 60 household along the stream. To save the life and property of these settlements Nu. 1,215,000.00 have been proposed to construct river protection work.
The activity involve construction of embankment by excavating in stream bed and laying excavated materials on stream banks of 320m long and 3m height on both side of bank and construction of boulder barriers in slide areas. Excavator machine shall be engage for the work with two labours.
The duration of the activity will be for one month and the planned date of implementation is around November 2021.

Figure 3: Keyjurong Stream

Potential social and environmental impacts of the activity are:

1. Workers health and safety,
2. Noise pollution by excavator,
3. Air pollution and
4. Stream contamination during excavation

4. Construction breast wall in the front of Four Unit Staff Quarter

The activity was differed from year 2020 due the COVID-19 situation. ESMP for the activity was developed and approved in the year 2020. Projected budget for the activity is Nu. 5,381,420.00.

Due to the budget constrain site development work to protect main structure could not be incorporated in tender document. Therefore, additional fund amounting to Nu. 800,000.00 have been proposed under the activity to implement environmental management plan. The proposed fund shall be utilized for the construction of breast wall in front of proposed four unit staff quarter.

4. Mitigation Measures for Environmental and Social Impacts

Potential impact	Impact scale	Proposed mitigation measures	Responsible Party	Costs (million)
Activity 1: **Restoration/Improvement of alpine meadows**				**Nu. 0.450**
Workers' health and safety,	Short term minor	• Comply with the workers' health and safety guidelines of BFL; • Use safety gears (boots, gloves & mask); • No underage work should engage for the work; • Reserve appropriate first aid kit (esp. for high altitude sickness; • Ensure decent work conditions, including an appropriate salary, working hours, accommodation ;	SWS management and BFL Focal	Incorporate in estimate
Waste generated by worker and	Short term minor	• Bring back all non-degradable waste to proper dumping site; • Make sure that no waste is left in alpine meadows	BFL Focal and site supervisor	NA
Soil erosion from exposed soil along steep slopes	Short term minor	• Soil exposed during improvement work should be covered with plant debris;	BFL Focal and site supervisor	Incorporate in estimate
Activity 2: **Restoration/Improvement of Grassland**				**Nu. 0.650**
Workers' health and safety,	Short term minor	• Comply with the workers' health and safety guidelines of BFL; • Use safety gears (boots, gloves & mask); • No underage work should engage for the work; • Reserve appropriate first aid kit (esp. for high altitude sickness; • Ensure decent work conditions, including an appropriate salary, working hours, accommodation ;	SWS management and BFL Focal	Incorporate in estimate
Waste generated by worker and	Short term minor	• Bring back all non-degradable waste to proper dumping site; • Make sure that no waste is left in working site.	BFL Focal and site supervisor	NA

Soil erosion from exposed soil along steep slopes	Short term minor	• Soil exposed during improvement work should be covered with plant debris;	BFL Focal and site supervisor	Incorporate in estimate
Activity 3: **River Bank Protection**				**Nu. 1.215**
Workers health and safety	Short term minor	• Comply with the workers' health and safety guidelines of BFL; • Use safety gears (helmet, earplug, safety boot & mask	BFL Focal and site supervisor	Incorporate in estimate
Noise pollution by excavator	Short term minor	To control noise pollution for nearby resident and workers, appropriate mitigation measures shall be adopted: • Excavator will be work during day time (8 AM to 5 PM) only, • Necessary noise control of excavator shall be performed before work, • Silencer of excavator shall be checked and make necessary correction prior to initiation of excavation work and • At any condition excavator shall not work beyond stipulated time.	BFL Focal, owner of excavator and site supervisor	NA
Air pollution	Short term minor	• Excavator with valid fitness and emission test result as per RSTA guideline shall be allowed to work, • Regular maintenance of excavator exhaust system shall be performed and • Unnecessary speeding of excavator engine level shall be controlled.	BFL Focal, owner of excavator and site supervisor	NA
Stream contamination during excavation	Short term minor	• Leakage or spill of oils from excavator shall be strictly avoided, • Haphazard excavation of stream shall be avoided, • Stream bank should not be choked during and after the completion embankment construction work, • Excavation shall de restricted within embankment construction site only, and • All necessary measures shall be undertaken to avoid unnecessary contamination of stream.	BFL Focal, owner of excavator and site supervisor	NA
Activity 4: **Construction of breast wall in front of proposed four-unit staff quarter construction, Merak Range**				**Nu. 0.800**
Waste generated by worker, and	Short term minor	• All non-biodegradable waste shall be carried back to proper dumping site,	BFL Focal and site supervisor	NA

		• Make sure that no waste is left in alpine meadows		
Workers' health and safety (Refer to the full OHS guidelines attached where ever relevant)	Short term minor	• Comply with the workers' health and safety guidelines of BFL; • Use safety gears (boots, gloves & mask); • No underage work should engage for the work; • Reserve appropriate first aid kit (esp. for high altitude sickness; • Ensure decent work conditions, including an appropriate salary, working hours, accommodation;	BFL Focal and site supervisor	To be part of worker agreement. From the activity cost
Workers' health and safety during COVID (related hygiene measures)	Short-term; Minor	Strictly abide by following COVID prevention protocols: • use face masks, • maintain proper distance, • wash hands regularly and sanitize it, • use Druk Trace app where ever available	-BFL focal - covid focal in office (if any)	

5. ESMP Implementation Arrangements

The implementation of project activities will be carried out by the BFL focal person in SWS. The focal person will be responsible for compliance with all procedures outlined in this ESMP, as well as compliance with any requirements to obtain clearances, permits, approvals, or consent documents from relevant authorities and stakeholders.

This ESMP should be part of the estimate/contract that the SWS will implement/sign with the Contractor(s) for implementation of the planned activities. The BFL Focal or concerned implementing entity 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. An OHS information session shall be organized by the implementing agency/Contractor for all workers prior start the project activities and prior any specific tasks with high health risks.

The SWS's Supervising Engineer needs to monitor the implementation of proposed measures by the Contractor and Contractor's subcontractors with visual checking, reviewing the records of evidence that the measures have been applied and ask the Contractor to apply the measures as soon as possible. Non-compliances should be recorded and the Report on any non-compliance should be reported to the ESS officer immediately, and the ESS officer will report it to the PCU (M&E Officer). Non-compliance should be closed with appropriate measure/s and the evidence should be kept.

As agreed upon, disbursement of project funds to the SWS will be contingent upon their full compliance with the safeguards requirements.

6. ESMP Monitoring Arrangements

The BFL focal person in SWS will closely monitor the implementation of all planned activities and the required mitigation measures, and ensure that they fully comply with this ESMP and with the terms and conditions included in the environment clearances issued by RGoB's national authorities.

SWS is also fully responsible for the compliance of all external contractors and service providers working in the SWS with the safeguard's requirements outlined in the ESMP.

Protocol for monitoring of activities under this ESMP will be carried out as follow;

Sl#	Activities	Monitoring team	Timeline		Location	Means of Verification
			Start	Complete		
1	Restoration/Improvement of Alpine Meadows	Field Focal	May 2021	May 2021	Merak & Sakteng	Field report
		ESS officer	4th week May, 2021			
2.	Restoration/Improvement of Grassland	Field Focal	Feb. 2022	March 2022	Merak & Sakteng	Field report
		ESS officer	3rd week Oct, 2021			
3	River Bank Protection	Field Focal	Nov. 2021	Dec. 2021	Sakteng	Structure & report
		ESS officer	1st week Dec, 2021			
4	Construction of breast wall in the front of proposed four-	Field Focal	July 2021	august 2021		Field Report

	unit staff quarter construction, Merak	ESS officer	4th Week Sept, 2021	Merak	

The activity shall be executed under the direct supervision of the implementing agency and report to BFL-PCU accordingly.

1. **Restoration/improvement of lowland grasslands and Alpine Meadow (habitat management):**

- Monitoring by implementing entities:
    - Field visits at least twice—during the intervention and within three months after the intervention
    - Reports by the implementing entities submitted to ESS officer within a week after each field visit
- Monitoring by ESS officer at PCU:
    - Field monitoring by ESS officer –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 – Annual report submitted to the BFL Fund Secretariat in January, 2022.
- Bi-annual reports of the Secretariat to WWF US (as part of mid-year and final APRs)

2. **Construction of breast wall in the front of proposed four-unit staff quarter construction, Merak**

Monitoring by implementing entities:

- Field visits—at least weekly
- Monthly reports by the implementing entities submitted to ESS officer

Monitoring by ESS officer at PCU:

- Field monitoring by ESS officer – monitoring of the work once during the implementation and through field report from IAs after completion of the work.
- Reports by ESS officer to BFL Fund Secretariat – Annual report submitted to the BFL Fund Secretariat in January, 2022.

Bi-annual reports of the Secretariat to WWF US (as part of mid-year and final APRs)

3. **River Bank Protection work**

Monitoring by implementing entities:

- Field visits—at least weekly
- Monthly reports by the implementing entities submitted to ESS officer

Monitoring by ESS officer at PCU:

a. Field monitoring by ESS officer – monitoring of the work once during the implementation and through field report from IAs after completion of the work.

b. Reports by ESS officer to BFL Fund Secretariat – Annual report submitted to the BFL Fund Secretariat in January, 2022.

Bi-annual reports of the Secretariat to WWF US (as part of mid-year and final APRs)

7. Capacity Need and Budget

Activities under this ESMP will be implemented by the BFL focal person, supervising engineer/staff, and a contractor that will employ workers as mentioned in the contract agreement.

The budget for each of the activities is:

Sl#	Activity	Amount (Nu.)
1	Restoration/Improvement of Alpine meadows	450,000.00
2	Restoration/Improvement of Grassland	650,000.00
3	River Bank Protection	1,215,000.00
4	Maintenance of Plantation	413,813.00
5	Construction of breast wall in the front of proposed four-unit staff quarter construction, Merak	800,000.00
Total		**3,528,813.00**

8. Consultation and Disclosure Mechanisms

This ESMP has been prepared in a participatory after due consultation with community and other stakeholders where necessary. Restoration/Improvement of alpine meadows and river bank protection work are continuous activity of year 2020 (year 2). Restoration/Improvement of alpine meadows shall be continued as per the resolution of public consultation conducted on 19-26 December 2019. Similarly, Keyjurong stream protection work shall be continued in accordance to the community consultation conducted on 23 October 2020.

Restoration improvement of grassland is an extension of alpine meadow restoration work hence consultation for the activity shall not be required. Maintenance of plantation involves tending of existing plantation hence public consultation for the activity is not necessary. However, this ESMP covers all social and environmental mitigation measures obligatory for implementation of BFL program.

The information of the consultation meeting is attached to this ESMP, along with a full list of participants (disaggregated by gender and age) and minutes of meeting.

The full English version of this ESMP shall be disclosed on the website of MoAF, BFL and WWF, Bhutan Program. Hard copies of the ESMP should also be available at the SWS Management Office and at the PCU Office.

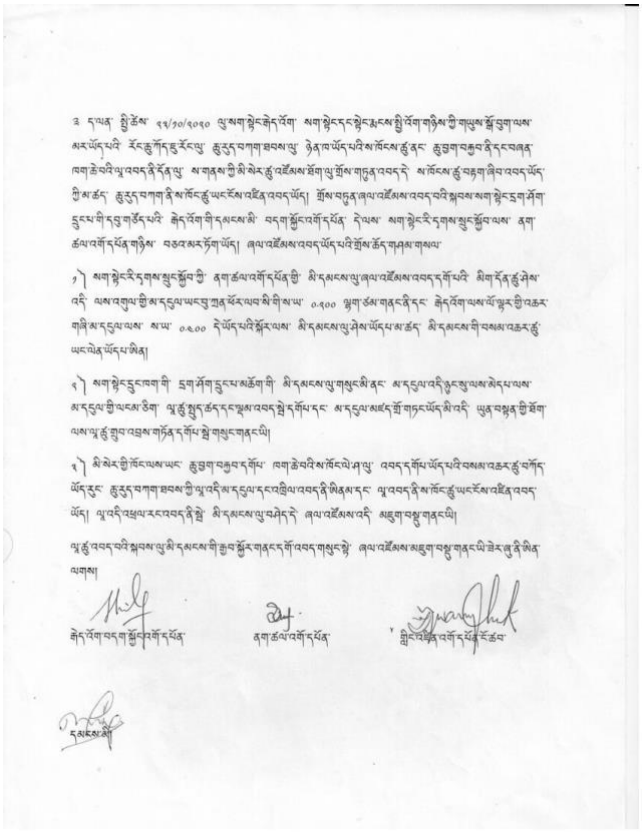
9. Stakeholder Engagement Plan

The local community that resides in the vicinity of the planned BFL activities in SWS will be engaged throughout the implementation of these activities.

For Keyjurong stream bank protection work excavator shall be engaged for digging and construction of embankment as implementation of work through manual labour is not feasible. As per the requirement local community shall be engaged for manual work for the activity.

Annexure 1. Consultation for the river bank protection work in Sakteng

Annexure 2. Consultation for the Alpine meadow development (report attached)



Bhutan for Life: Sex disaggregated community participants detail

Title: Cons Public Consultation meeting for Riverbank protection work at Satteng (Kaygzhorong).

Implementing Agency: GWS

Venue: Kaygzhorong, satteng.

Date: 23/10/2020

Invitation Reference No:

Sl. No.	Name	Gender (male, female, others)	Age Range (below 18, 18-20, 21-25, 26-30, 31-35, 36-40, 41-45, 46-50, 51-55, 56-60, 61-65, 66-70, 71-75, 76-80, above 80)	Vulnerable group (youth, differently abled, etc.)	Signature	Remarks (designation)
1.	Leki Chozom	Female	18-20			
2.	Rinchen Tashi	Male	26-30			
3.	Leki Drakpa	"	41-45			
4.	Pema Chozom	Female	36-40			
5.	Pema Yangchen	"	18-20			
6.	Tshering Drakpa	Male	46-50			
7.	Phurpa Wangdi	"	51-55			
8.	Leki Tsomo	Female	36-40			

9.	Dawa Choden	Female	36-40
10	Sangay Choden	11	61-65
11.	Rinchen Dema	11	31-35
12.	Leki Dorji	Male	51-55
13.	Dorji Wangdi	11	61-65
14.	Dorji Wangdi	11	31-35
15.	Nima Tsomo	Female	41-45
16.	Pema Sonam	Male	~~22-25~~ 16-20
17.	Kelzang Tshering	-11-	51-55
18.	Phuntsi Choezom	Female	46-50
19.	Pema	11	51-55
20	Tsewang Dorji	Male	31-35
21.	Thukten Tsomo	Female	21-25
22.	Dorji Wangdi	Male	46-50
23.	Rinchen Dema	Female	36-40
24.	Pema Sonam	Male	26-30
25.	Pema Dorji	-11-	41-45
26.	Pema Leki	-11-	26-30
27.	Mani Dema	Female	31-35
28.	Leki Yangzom	11	51-55

29	Tshering Nidup	Male	71-75
30	Pema Yangzom	Female	36-40
31	Leki Tshering	Male	31-35
32	Dechen Dema	Female	51-55
33.	Dorji Lekdra	Male	31-35
34.	Poudon	Female	51-55
35.	Nima Tshering	Male	26-30
36.	Leki Phuntso	Male	46-50
37.	Pema Yangzom	Female	41-45
38.	Sangay Dema	-11-	41-45
39.	Dorji Penba	Male	51-55
40.	Rinchen Lhadon	Female	18-20
41.	Dorji Tsomo	-11-	61-65
42.	Sonam	-11-	61-65
43.	Kelzang Lhagpa	Male	51-55
44.	Karma Toko	Female	55-56
45.	Tsomo	-11-	51-55
46.	Tamyang Delma	-11-	26-30

Annexure III. <u>BFL: SUGGESTED OCCUPATIONAL HEALTH AND SAFETY STANDARDS</u>

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)[1] 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 stall 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. Legionnella pneumophilia) 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 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 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[2]

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 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