

Bhutan For Life

**Environmental and Social
Management Plan for Biological
Corridor 08**

January 2023 - June 2024

Biological Corridor 08
Divisional Forest Office / Bumthang

Table of Contents

1. Introduction	2
1.1 Project Background	2
1.2 Scope of ESMP	2
1.3 Purpose of ESMP	2
1.4 Applicable law, policies, and regulation	3
2. Environmental and Socio-Economic Conditions.....	4
2.1 Geological and topographical conditions	4
2.2 Climatic conditions.....	5
2.3 Hydrological conditions	5
2.4 Flora and fauna.....	6
2.5. Socio-economic conditions	9
3. Planned activities for January 2023 - June 2024	11
3.1 Restoration of lowland grasslands at Jongthang	11
4. Potential social and environmental impacts	12
4.1 Restoration of lowland grasslands at Jongthang	12
5. Mitigation Measures for Environmental and Social Impacts	12
6. ESMP Implementation arrangements	14
7. ESMP monitoring arrangements.....	14
8. Capacity Need and Budget	15
9. Consultation and Disclosure Mechanisms	15
10. Stakeholder engagement plan.....	15

Bhutan for Life
Environmental and Social Management Plan for Biological Corridor 06 (Trashigang)
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

2.1 Geological and topographical conditions

BC 08 landscape (577.90 km²) is one of the largest protected areas among 8 BCs in the country and home for several flora and fauna given a wide altitudinal range and forest types. Strategically located in central part of Bhutan, BC 08 plays significant ecological functions in the Bhutan Biological Conservation Complex. It interconnects Jigme Dorji National Park (JDNP) in the north, Wangchuck Centennial National Park (WCNP) in the north, and Jigme Singye Wangchuck National Park (JSWNP) in the south by three distinct strands that traverse across administrative jurisdiction of Wangdue and Bumthang Dzongkhags. BC 08’s connectivity with JSWNP, which share its southeastern boundary with Royal Manas National Park (RMNP) in the tropics, therefore, is expected to facilitate the movement of fauna and shift or dispersal of flora in response to changing pattern of climate.

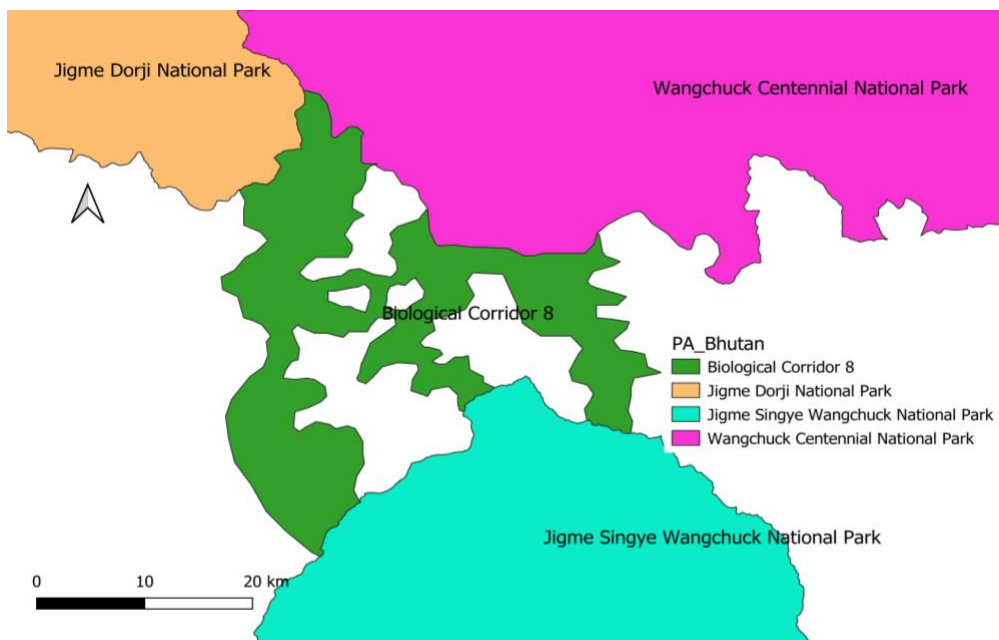


Figure 1: Northern Biological Corridor interconnecting Protected Areas

Besides ecological benefit to wildlife, BC 08 also provides space and it is a source of forest resources for more than 7928 people residing in and around it from Wangdue and Trongsa

Dzongkhags. Given a maximum area (469.10 km²) under Wangdue Dzongkhag, it hosts Phobji, Gangtey, Bjena, Dangchu, Sefhu Kazhi and Athang Geogs while 108.80 km² under Trongsa Dzongkhag is a home for people of Tangsibji and Nubi Geogs. There are 423 households in and around the BC 08 under Trongsa Dzongkhag, and 466 households in and around the BC 08 under Wangdue Dzongkhag (Geog, 2018). Figure 1 shows the BC 8 connecting the different parks.

2.2 Climatic conditions

Climate change, if not taken into account seriously as one important constituent in planning the landscape conservation, then the plan certainly is incomplete because Bhutan is not an exception from global effect of climate change being located between two populous countries in the world. Given the fact that farmers in the BC 08 are closely related to nature in terms of resources use and interactions their perceptions on climate change pattern, severity, and impacts were drawn to help develop practical and realistic management plan. About 96% of respondents from Trongsa and about 55% of respondents from Wangdue reported increase in temperature that directly affected fluctuation in flowering and budding, and agriculture crops besides migratory avifauna. They observed birds of lower elevation shifted in their area of higher elevation. Fluctuation in plant phenology pattern were also observed by 93% of farmers from Trongsa while 33.7% of respondents from Wangdue division area noticed lesser amount of snow fall within a longer duration of winter season.

2.3 Hydrological conditions

Water is a very crucial component for wildlife, just as it is important for humans. In terrestrial ecosystem, linkage between forests and water creates a mosaic, benefiting the wildlife by creating suitable habitats. Given the healthy forest ecosystem, drainage and water in the BC 08 is not something to worry about, as much as other terrestrial protected areas in some part of the world. BC 08 has good drainage that includes both perennial and seasonal water for the wildlife (Fig. 3) irrespective of forest types. In some areas, due to geomorphological reason, the higher ridges and uplands are deprived of water. According to the observation made during the biodiversity survey, it was noted that large bodied wild animals that require relatively more amount of water are required to travel a longer distance as observed to fulfill their water requirement.

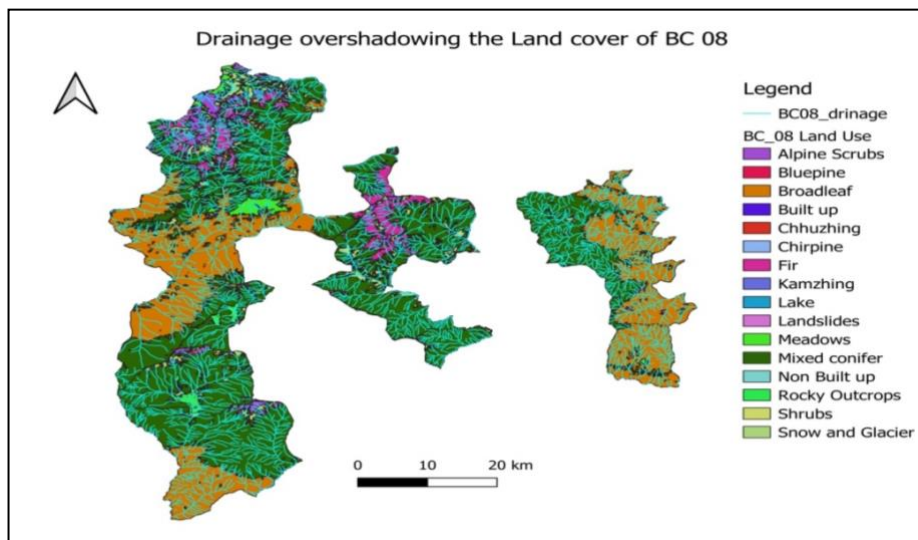


Figure 2: Water bodies distribution in various forest types

2.4 Flora and fauna

Biological Corridor 08 landscape has large forest coverage with more than 99% of its total area 577.90 km² including shrubs and alpine scrubs. Snow glacier and other geomorphological features that includes built up (settlements, roads, transmission line) and rocky areas form 0.30% of the total area of the BC 08 (fig. 7 below). The land cover distribution is shown in Figure 3.

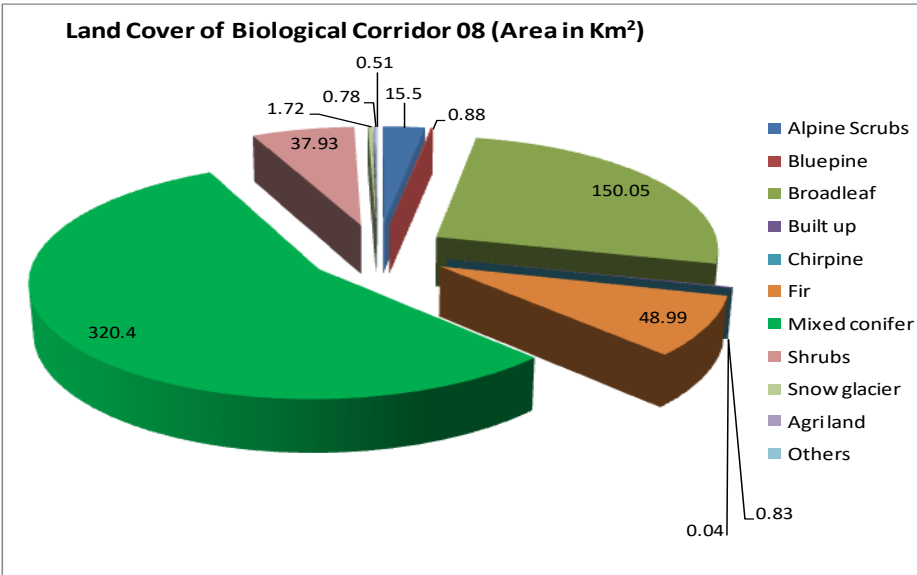


Figure 3: Land cover of BC8

The vegetation of the BC 08 was classified into various forest types in order to give better picture about it and forming heterogeneous habitats for wildlife. The classifications of the forest types were based on the ordination of Rapid Biodiversity Assessment (RBA%) of the entire tree and shrub species in each Geog and also on the cluster dendrogram arbitrarily marked at 50% similarity threshold (refer fig. 8 for detail as shown below). Three types of forests in the Biological Corridor 08 chiefly included Hemlock and Fir forest, Cool broad-leaved forest and Evergreen oak forest respectively.

Endowed with wide altitudinal range the BC 08 was reported for rich diversity of flora that were distributed across warm broadleaf through alpine scrub. During the survey that was conducted between May to June 2019, we recorded at least 297 species of plants (Appendix I). Out of these many plant species, there were 10 species of conifer evergreen trees; 30 species of broadleaf evergreen trees; 68 species of deciduous trees; 27 evergreen shrub species and 11 deciduous shrub species. Rest of the list included herbaceous plants, bamboo, and orchids.

In the BC 08, five live form compositions vastly included ever green conifer tree, deciduous tree, evergreen tree, ever green shrubs, and deciduous shrubs. The overall life-form composition appeared to be considerable proportion of evergreen conifer trees with 50.51 %, evergreen trees 28.47%, deciduous trees 19.99%, evergreen shrub 0.93 % and deciduous shrub 0.11 % for 17 Geogs as shown in Table 1.

Phobji Geog forest was predominantly composed of evergreen conifer trees with more than 93% while Athang and Dangchu Geogs forests hosted relatively more deciduous trees that was

composed of *Prunus species*, *Betula alnoides*, *Betula utilities*, *Acer species*, *Juglans regia*, *Alnus nepalensis*, *Sorbus insignia*, etc. Nubi and Nyisho Geogs were dominated by evergreen tree that largely included various *Rhododendron species*, *Symplocas species*, *Quercus lamellosa*, *Quercus lanata*, *Quercus semicarpifolia*, *Quercus glauca*, *Lyonia ovalifolia*, *Persea species*, etc. While deciduous shrubs were barely recorded across all 10 Geogs while evergreen shrubs were recorded in warmer region from the forests of Nyisho and Sephu Geogs.

Table 1: Geog-wise life form composition derived from the sum of RBA

Geogs	Evergreen Conifer Tree	Deciduous Tree	Evergreen Tree	Evergreen Shrub	Deciduous Shrub
Nubi	2.40	15.52	82.09	0.00	0.00
Tangsibji	57.53	9.19	33.28	0.00	0.00
Athang	0.00	60.70	39.30	0.00	0.00
Bjena	90.26	0.58	9.16	0.00	0.00
Dangchu	8.48	54.34	36.91	0.00	0.26
Gangteng	84.36	8.14	7.50	0.00	0.00
Kazhi	72.35	8.01	19.64	0.00	0.00
Nysho	27.26	0.71	69.71	2.31	0.00
Phobji	93.30	1.70	5.00	0.00	0.00
Sephu	75.90	14.46	9.31	0.52	0.25

Information about faunal diversity was exclusively on mammals and avifauna in the BC 08. From the camera trap survey (May July 2019), 5 felid species such as Asiatic golden cat (*Catopuma temmincki*), clouded leopard (*Neofelis nebulosa*), tiger (*Panthera tigris*), leopard cat (*Prionailurus bengalensis*) and marbled cat (*Pardofelis marmorata*); 3 canid species - wild dog (*Cuon alpinus*), red fox (*Vulpes vulpes*) and domestic dog (*Canis lupus familiaris*); 1 viverrid species (Weasel) which was unidentified, 1 ursid - Himalayan black bear (*Ursus thibetanus*); 2 cervid species - barking deer or muntjak (*Muntiacus muntjak*) and sambar (*Rusa unicolor*); 2 caprine species under bovid family - Himalayan serow (*Capricornis thar*), Himalayan goral (*Naemorhedus goral*); 2 bovid species - yak (*Bos grunniens*) and other cattle (local and mithun breed); 1 equid - domestic horse (*Equus caballus*); 1 moschid - Himalayan musk deer (*Moschus chrysogaster*); 1 ailurid (*Ailurus fulgens*); 1 primate species - Assamese macaque (*Macaca assamensis*), 1 mustelid - Himalayan yellow throated marten (*Martes flavigula*); 1 suid - wild pig (*Sus scrofa*), and 3 rodents - Indian porcupine (*Hystrix indica*) including squirrel and rat were recorded.

Not even a single image of common leopard was captured from the area under both the divisions for unknown reason during the survey that was carried out in the summer. Mammal species of conservation significance in the Biological Corridor 08 are as shown in the table below with IUCN status.

Table 2: Species of conservation significance in Biological Corridor

Sl No.	Common name	Scientific name	IUCN status	Image captured (June -August 2019)
1	Tiger	<i>Panthera tigris</i>	Endangered	Recorded in both the divisions

2	Dhole (wild dog)	<i>Cuon alpinus</i>	Endangered	Recorded in both the divisions
3	Red panda	<i>Ailurus fulgens</i>	Endangered	Recorded in Wangdue division
4	Himalayan musk deer	<i>Moschus chrysogaster</i>	Endangered	Recorded in both the divisions
5	Clouded leopard	<i>Neofelis nebulosa</i>	Vulnerable	Recorded in Bumthang division
6	Sambar deer	<i>Rusa unicolor</i>	Vulnerable	Recorded in both the divisions
7	Asiatic golden cat	<i>Catopuma temminckii</i>	Near threatened	Recorded in both the divisions
8	Marbled cat	<i>Pardofelis marmorata</i>	Near threatened	Recorded in Wangdue division
9	Himalayan serow	<i>Capricornis thar</i>	Near threatened	Recorded in both the divisions

A total of 264 bird species, including four near threatened species like Himalayan vulture, Satyr tragopan, Ward's trogon and Yellow-rumped honey guide were recorded during the survey carried out in June and July 2019 across two divisions in the BC 08. The highest number of species recorded was in Wangdue division as presented in table below.

Table 3: Total bird species recorded under respective territorial division

Sl.#	Division	Total species
1	Wangdue	189
2	Bumthang	118

At least four globally threatened bird species were recorded during the short span of survey time. The survey might have overlooked other avifauna species including the species of conservation significance due to weather condition in summer despite time and effort dedicated by the survey team. Table 4 shows the details of significant avifauna recorded across two divisions in the Biological Corridor.

Table 4: Birds of conservation significance in BC 08

Common name	Count	IUCN status	Name of place recorded	Habitat/forest type
Himalayan Vulture	9	Near threatened	Tshelatop & Sephu under Wangdue division	Mixed conifer, meadows and cool broad-leaved forest
Satyr Tragopan	37	Near threatened	Phobjikha, Sephu, Tshelatop, Gogona, Shobla and Longmey under Wanguphodrang division; Drangichu and Dranglajem top under Bumthang division	Mixed conifer, Alpine Scrub, Cool broad-leaved forest and Meadows
Ward's Trogon	4	Near threatened	Nobding under Wangduep	Cool broad-leaved forest

Yellow-rumped Honeyguide	7	Near threatened	Nobding under Wangdue division	Cool broad-leaved forest
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2.5. Socio-economic conditions

Agriculture and livestock farming practices are integral components of socio-economic characteristic of 423 households in and around the BC 08 under Trongsa Dzongkhag, and 466 households in and around the BC 08 under Wangdue Dzongkhag (Geog, 2018), the farmers in rural areas. Some households in BC 08 were found engaged in private entrepreneurship or small-scale business. Almost all the villages were reported for having government employees including military personnel that attributes in forming a diverse composition of socio-economic characteristic. Dependence on forest resources was unavoidable, and farmers living in and around biological corridor were reported to utilize timber, firewood, and non-wood forest products. For instance, Cordycep and *Paris polyphylla* appeared to contribute significantly for the livelihood of people in BC 08.

Most commonly cultivated cereal crops across two divisions were found to be paddy and maize in the lower elevation while wheat was found largely in highland. Maize was barely cultivated while rice as a staple food was vastly cultivated by for farmers of Trongsa. Wheat and barley were grown across two Dzongkhags and used to brew local beverage and as a feed for cattle. Farmers also cultivated potato as cash crop while radish and turnips were grown both for consumption and to feed the cattle. Increasing chili cultivation was largely known for consumption and commercial purpose. Tseri or shifting cultivation was not reported in the biological corridor. Therefore, local extinction of some agriculture crop variety was reported by people for a discontinued shifting cultivation practice over the last two decades.

Livestock farming was reported as one of the key components of agriculture and, thus being a main source of livelihood for subsistence of farmers in this biological corridor. Farmers across two Dzongkhags were reported for rearing various types of livestock for food (butter and cheese), draught power, means of fertilizers, raw materials for cloths, and transportation. As a result, livestock farming appeared to forms an integral part of rural poverty reduction strategies (RNR statistics, 2015). Largely, farmers reared traditional cattle breed across thus forming 52% of livestock composition in general. Farmers of Wangdue reared huge number of local cattle compared to farmers of Trongsa. The reason for rearing the local cattle was reported for rugged terrain that is very difficult to adapt by the improved breed.

Farmers from Trongsa were seen to take pace in rearing Brown Swiss and Jersey breed due to warm climatic condition. Thus, improved breed appeared to attribute 25% of livestock composition across two Dzongkhags. Yak and mithun breeds were reported for diminishing year after year in Wangdue dzongkhag due to rising alternative livelihood sources. In the highland, brown Swiss cattle were reported for taking a faster pace to replace local cattle. Some farmers from Wangdue reared caprine (sheep) for wool production and was largely used for weaving yathra. Table 5 shows the number of farmers rearing different cattle and breed in Wangdue phodrang and Bumthang.

Table 5: Livestock composition (number of heads) across BC

Division	Traditional cattle	Improved breed	Mithun breed	Yak	Equine	Caprine
Wangdue	613	76	26	476	32	121
Bumthang	324	457	5	0	9	0

About 70% of the respondents under Wangdue division reported that agriculture crop cultivation in their own land was a main source of livelihood composition and therefore a top priority. For less than 5% respondents, agriculture farming was secondary while more than 15% respondents reported Cordyceps and weaving yathra were main livelihood sources. At least, 10% respondents asserted that livestock farming was their integral component of livelihood composition. Farmers under this Dzongkhag division never went out for casual labor and therefore it was not a part of their livelihood composition.

For the farmers of Trongsa, agriculture farming was integral part of livelihood composition. About 40% of the respondents ranked agriculture farming as top priority while for 14% respondents it was secondary. At least 20% respondents asserted that livestock farming was their top priority while it was tertiary for about 17% respondents. Unlike farmers of Wangdue, at least 7% respondents asserted that main source of livelihood was casual labor for farmers of Trongsa.

Farmers are worried about the food grain self-sufficiency in the two Dzongkhags in the biological corridor. Almost 99% respondents from Wangdue and 84% from Trongsa reported the purchase of food grains. Only less than 1% respondents from Wangdue and 16% respondents from Trongsa reported for self-sufficient grain production from their own land. Places where rice was not grown for unfavorable climatic conditions like Phobji, Gangtey and Sephu, farmers have to purchase the grains.

Food security was also determined from the perspective of vegetable, cheese and butter self-sufficiency for a household. In this regard, 90% respondents from Wangdue reported that they largely produce vegetables from their own garden for home consumption and same was the case with butter and cheese production. Purchase of cheese and butter are reported by about 30% respondents from Wangdue.

In the case of farmers of Trongsa, they produced sufficient vegetables for their home consumption according to about 95% respondents while primary source of vegetable were forest and shops for at least 5% respondents. About 65% respondents reported that their secondary source of vegetable was shop. More than 65% respondents from Trongsa reported they are self-sufficient for butter and cheese production while more than 8% respondents said that they purchased from other farmers in the village.

Cash income sources of the farmers in BC 08 varied from labor for agriculture, sale of forest products, sale of livestock products, casual labor, business, weaving, salary of employee, and house rent and, out of these many sources, in case of Wangdue farmers, sale of agriculture products was the predominant income source for 55% respondents. For about 30% respondent's livestock product was their secondary cash income source, and forest products that vastly included Cordyceps was reported as primary income source for more than 15% respondents from Sephu and Dangchu Geogs. The agriculture labor and casual labor were absolutely insignificant income sources for

this segment of people. Overall, agriculture products were a main source of cash income followed by livestock products, which include butter, cheese and milk, and forest products for the farmers of Wangdue.

Farmers of Trongsa generated cash income predominantly from agriculture and livestock products as well. More than 48% respondents reported agriculture products as primary cash income source while about 26% asserted it as secondary income source. More than 39% respondents reported livestock as primary and secondary income source. In general, livestock product (basically a sale of butter and cheese) is inarguably a vital cash income source according to assertion made by 79% respondents followed by agriculture products and casual labor with 74% and 22% respectively in case of farmers of Trongsa. Non-Wood Forest Products (NWFPs) was tertiary cash income source according to less than 1% respondents from Trongsa. Only 2% respondents from Trongsa reported forest products as one of the cash income sources.

3. Planned activities for January 2023 - June 2024

3.1 Restoration of lowland grasslands at Jongthang

- a. Budget: Nu. 300,000
- b. Timeline: January - June, 2023
- c. Location: Jongthang, Nubi Gewog, Trongsa

Human-wildlife conflict is emerging as one of the main constraints to the Community's Agricultural Sustainability and has a major impact on their farming system. Predation of livestock by large carnivores such as tigers has intensified over recent years reported especially in Nubi Gewog. The interaction between rural communities and wildlife has turned negative over the years as a result of increasing human-tiger conflict incidences. The core reason for the increase in human-tiger conflict incidences in the Jongthang area is mainly poor herding practices, large local breeds holding size, lax herding, encroachment of all existing community grazing lands by forest, by overgrazing and encroachment in tiger habitat.

Given the increasingly reported cases of human-tiger conflict (HTC) cases in the Jongthang village under Nubi Gewog, Trongsa, there is an urgent need to initiate an Integrated Community-Based Pasture Development by Installing Electric fencing to provide an appropriate compensation mechanism that will minimize Livestock kill and ensure the safety of both human life and their assets and the wildlife and their habitats for the long-term. With such intervention, it also aims to promote community ownership to resolve and manage human-tiger conflict at the community level.

This is a part of intervention to bring back the previous state of land by improving the grass land to maintain ground cover for enriching soil and water. Restoration of lowland grasslands at Jongthang, Nubi Gewog includes following sub-activities:

1. Survey and Mapping
2. Procurement of Electric Fencing Materials and Grass Seeds
3. Construction of Electric Fencing
4. Sowing or Broadcasting of Grass Seeds

Survey and mapping and procurement of e-fencing materials will not have impact and need not to be screened. However, sowing/broadcasting of grass seeds to improve the existing grassland and installation of e-fencing will be done by local workers.

4. Potential social and environmental impacts

4.1 Restoration of lowland grasslands at Jongthang

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

i. Environment Impacts:

- Management of wastes generated from the e-fencing component
- Spread of invasive alien species during seed procurement, if not cautious
- Wildlife hunting by the workers

ii. Social Impacts

- Worker's health and safety

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 mitigations measures	Responsibility party	Cost
Activity 1: Restoration of lowland grasslands at Jongthang				Nu. 3,00,000
1. Waste generation from the e-fencing component	Minor (Short term)	<ul style="list-style-type: none"> • Identification and segregation of different waste types at the site; • Proper containers/waste bins should be provided at the activity site; • Dumping of waste on the sides of the road, on private land, or in other non-designated places should be prohibited; and • Collection, transportation and final disposal of all waste to designated waste disposal site will be undertaken regularly. 	BC-08 Focal	To be part of the activity cost
2. Spread of invasive alien species	Minimum/ minor (Short term)	<ul style="list-style-type: none"> • The grass seeds broadcasted will be native; and • Regular weeding and control measures need to be carried out. Biological control measures (broadcasting desired species) need to be emphasized 	BC-08 Focal	To be part of the activity cost

3. Wildlife hunting by the workers	Minimum/ minor (Short term)	<ul style="list-style-type: none"> • The laborers will be briefed and made aware that fishing without valid permit is an illegal and the forestry official will monitor regularly. 	BC-08 Focal	To be part of the activity cost
4. Workers' health and safety	Minimum/ minor (Short term)	<ul style="list-style-type: none"> • Comply with the workers' health and safety guidelines; • 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 decent work conditions, including an appropriate salary, working hours, accommodation and other essential amenities as per the Operational Health and Safety Guidelines are available for 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, and disciplinary practices; and • Implement a grievance mechanism for workers (and their organizations, where they exist) to raise workplace concerns- the worker with grievance shall report in their grievance to 	BC-08 Focal	To be part of the activity cost

		Range/beat/ HQ or gewog office. All workers shall be briefed about the GRM before starting the work.		
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6. ESMP Implementation arrangements

The project activities will be implemented by the BFL focal person. The focal person will be responsible for aligning the procedures with ESMP. Compliance with existing rules to obtain clearances, permits, approvals, or consent documents from relevant authorities and stakeholders will also be monitored by the focal person. The BC-08 Focal needs to monitor the implementation of the proposed measures. This should be done through visual checks and review of the records of evidence. Non-compliances should be recorded in a non-compliance report and submitted to the BC-08 Management immediately who will report it to the ESS Focal Officer at the PCU. Any non-compliance should be dealt with appropriate measures and the evidence should be maintained.

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

7. ESMP monitoring arrangements

The BFL focal of BC-08 will closely monitor the implementation of the planned activity and the required mitigation measures and ensure that they fully comply with this ESMP. The terms and conditions included in the environment clearances issued by RGoB's national authorities wherever and whenever required must be strictly followed. The BC-08 management is also fully responsible for the compliance with the safeguard requirements outlined in the OHS annexed. Protocol for monitoring of activities under this ESMP will be carried out as follow:

Sl. No	Activities	Monitoring team	Timeline		Location	Means of Verification
			Start	Complete		
1	Restoration of lowland grasslands at Jongthang	Field Focal	Jan 2023	June 2023	Jongthang	Field visits and Reports
		ESS Focal	May 2023	May 2023		Field visits and 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; 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 two activities under this ESMP will be implemented by the BFL focal person, Chief Forestry Officer, supervising engineer, and a contractor that will employ workers as mentioned in the contract agreement.

Sl. No.	Activity	Amount (Nu.)	Budget for ESS mitigation
1	Restoration of lowland grasslands at Jongthang	300,000	To be met from activity cost
Total		300,000	

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 ESMP has been prepared by BC-08 management under Divisional Forest office, Bumthang in consultation with the Gewog Administration, Nubi Gewog. A community consultation will be conducted to draw the bylaws and will be properly documented.

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 BC-08 Management Office (Divisional Forest office, Bumthang) and at the PCU Office.

10. Stakeholder engagement plan

As per the proposal from the Gewog Administration, Nubi Gewog, the labour contribution will be borne by the beneficiary community. All the procedures and activities in the projects will be coordinated, managed, and implemented by the Gewog Administration in coordination with Forest Office. The monitoring and evaluation of the activity is expected from the BC-08 Management Office.

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 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

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