

Bhutan for Life

Environmental and Social Management Plan for

Biological Corridor 4

(2022)

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 each park authority (PA) and biological corridor (BC), and by the contractor to be commissioned by each PA/BC 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.

2. Environmental and Socio-Economic Conditions

Biological Corridor 4 (BC 4) covers an area of 594 sq.km and the elevation ranges from 228-4570 masl and it is largest of the biological corridors in Bhutan. It has 94 species of vascular plants, 25 species of mammal and 150 species of birds.

The management of the BC 4 is managed by Zhemgang Forest Division, and there are four technical sections. Two range offices from Zhemgang Forest Division and one from Bumthang Forest division are immediate implementation of conservation works as shown in figure 1.

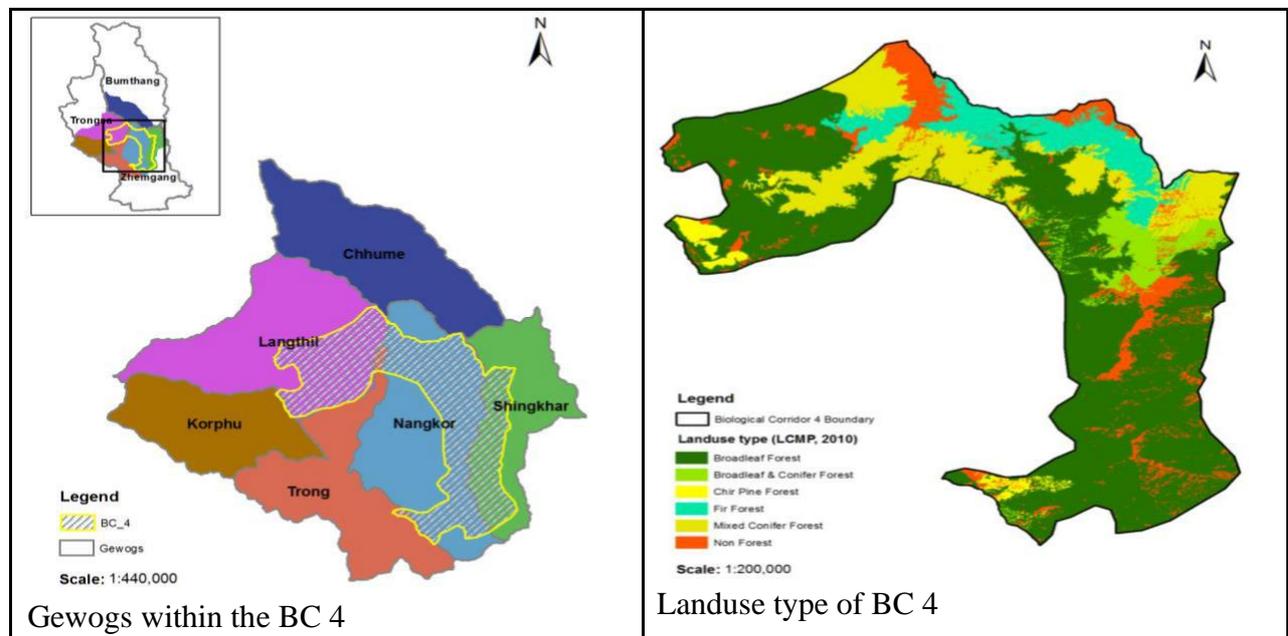
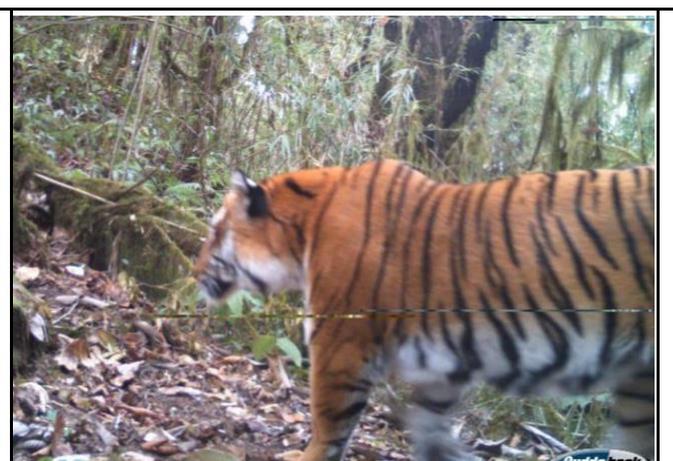


Figure 1: Maps of BC 4

Mammals recorded from the photographic capture as provided under the Figure 2 are: Tiger, Asiatic golden cat, marbled cat, Sambar deer (female & male), red panda, black bear, long tail shrike, whiskered Yuhina, Long tail minivet, Himalayan monal pheasant and blood pheasant.



Tiger



Tiger



Asiatic Golden cat



Marbled cat



Sambar deer (Female)



Sambar deer (Male)



Red Panda



Black Bear



Bhutan Laughing Thrush



Long tail shrike



Whiskered Yuhina



Long tail minivet



Himalayan monal pheasant



Blood pheasant

Figure 2: Photos of mammals, birds and plants species in BC 4

BC 4 covers four Gewogs as given in the Table 1. People in the area are mostly Khengpa. It has 74 households permanently inside the BC4 and 250 households in its buffer area. Socio Economic Survey conducted from the year 2015-2016 reveals that there are two dialect speaking community living in and around the corridor boundary. It holds a population of 7653. The ratio of men and women are almost equivalent with 3869 men and 3784 women as seen in the graph in the Figure 3.

Table 1: Four gewogs covered by BC 4

Sl. No.	Geogs inside BC 4	Dzongkhag
1	Langthel	Trongsa
2	Trong	Zhemgang
3	Nangkhor	Zhemgang
4	Shingkhar	Zhemgang

The major source of livelihood for the communities residing inside and along the buffer (5 km outside the boundary) of the corridor is from agriculture and livestock rearing. Livestock rearing is more than a source of income to household as it provides food for nutrition and manure for agriculture. Agricultural farms and meadows form about 10 sq. km of the total area. Occasionally, additional income was also generated from sale of non-wood forest products and daily wage labour.

There are three types of agriculture which can be categorised in the BC region: wetland (chhuzhing), dry land (kamshing) and Tseri (swidden agriculture). The wetland is the most productive of these and requires a good deal of water. As a result, it is not very widespread and can only be found in those parts that have good irrigation facilities.

Kamshing or dryland cultivation is the most common as can be seen in land holding graph under Figure 3. It is practised by nearly every household in the Chiwog. Tseri cultivation is also commonly seen in patches though the government has discouraged such practices due to impact of environment damage.

In addition to such cultivation of grains, all farming households also maintain kitchen gardens, where they grow a variety of vegetables. Although some of the vegetables are sold in the nearby towns of the villages, cultivation of grains are mainly subsistence-oriented, aiming only to meet the needs of the household. Mandarin, banana, guava constitute the most important cash crop in the region but they are mostly grown in small scale. Cardamom plantation is the common cash crop followed by hazelnut plantation to supplement the income of the farmers.

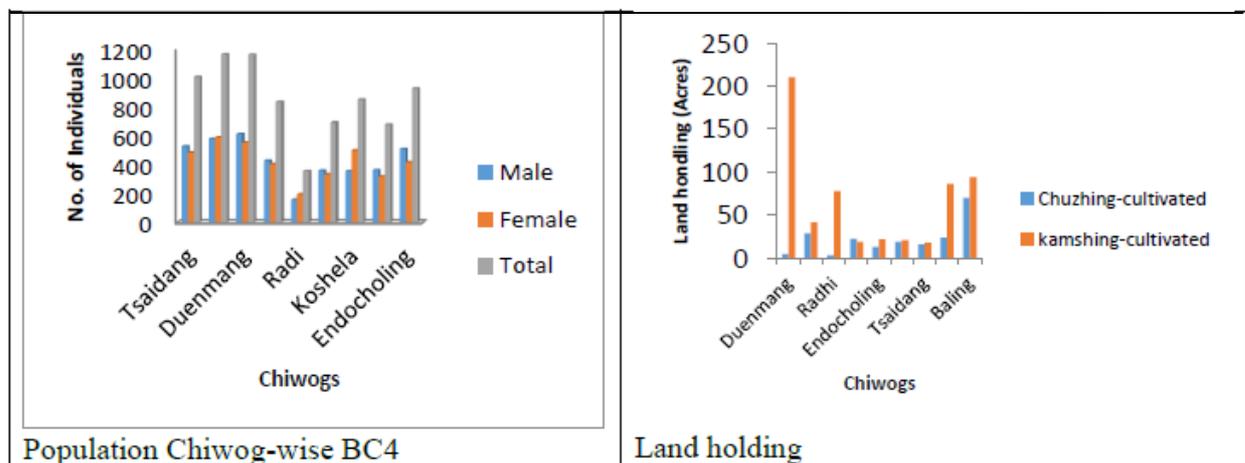


Figure 3: Population and landholding details in BC 4

3. Planned activities in Year 2022

Activity 1: Improvement of low grassland at Pirchen by removing unwanted invasive alien species and promoting grass growth by controlled patch burning

- Budget: Nu 250000.00
- Timeline: January to March 2022
- Location: Pirchen

Development of low land grassland activity will be implemented at Pirchen grassland. The area falls within the buffer area of Jigme Singye Wangchuck National Park and Biological Corridor 4. Grassland development area includes total of 4.58 hectares. The area is used by the ungulates for grazing and one cattle herder from Wangdigang.

The area is very flat and it has potential of hosting abundant wild animals but currently the area is covered by the invasive alien herbs and shrubs, which are not used by the wild ungulates and local cattle. The present activity will include removal of unwanted herds and shrubs and burning of the same to enhance grassland.



Activity implementation site map

Environmental and Social Impacts and Mitigation Measures

Potential environmental and social impacts that could arise from implementation of restoration and improvement of grasslands are as below:

- Workers' health and safety
- Waste from workers campsite
- Increase poaching
- Accidental Forest fire during burning of residual debris
- Accidental removal of Endangered and ecologically significant species
- Growth of non-palatable species

Therefore, for all the potential adverse impacts of environment and social related to this activity and mitigation measures have been prepared as shown below:

Potential impact	Impact scale	Proposed mitigation measures	Responsible party	Cost
Activity 1: Improvement of low grassland at Pirchen by removing unwanted invasive alien species and promoting grass growth by controlled patch burning				US\$ 3751.4
Worker's health and safety including precautions related to COVID-19	Short term minor	<ul style="list-style-type: none"> Comply with the workers' health and safety guidelines Access to health facilities for the workers pre and during construction activities need to be available and ensure first aid kit is available at construction site all the time Ensure that no underage workers, or children are engaged 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. Implement a grievance mechanism for workers (and their organizations, where they exist) to raise workplace concerns Follow COVID 19 safety protocols circulated by Ministry of Health (MoH) 	Zhemgang Range office and Tingtibi beat office	Workers health and safety gears: Nu.10000 /- (embedded in the activity budget)
Waste from workers camp site	Short term minor	<ul style="list-style-type: none"> Dumping of waste in the grasslands, on the sides of the road, on private land, or in other non-designated places should be strictly prohibited. Dumping of waste shall be prohibited on fragile slopes, forests, religious or other culturally sensitive areas or areas where livelihood is derived; Collection, transportation and final disposal of all waste should be carried out after completion of the work 	Zhemgang Range office and Tingtibi beat office	To be incorporated into workers contract agreement

Increased poaching	Short term Minor	<ul style="list-style-type: none"> BC authorities shall carry out increased patrolling during and after implementation of the activity. 	Zhemgang Range office and Tingtibi beat office	As part of the regular patrolling.
Accidental Forest fire during burning of residual debris	Short term Minor	Control measures like controlled/ prescribed burning (firelines, fuel load reduction, backfiring etc.) need to be carried out.	Zhemgang Range office and Tingtibi beat office	Regular monitoring
Accidental removal of Endangered and ecologically significant species	Long term Minor	Preliminary assessment of species composition and species mapping need to be carried out before implementation of the activity	NCS section, Zhemgang Range office and Tingtibi beat office	Nu.30000 /- (embedded in the activity budget)
Growth of non-palatable species	Short term Minor	Regular weeding and control measures need to be carried out. Biological control measures (broadcasting desired species) need to be emphasized	Zhemgang Range office and Tingtibi beat office	Nu.10000 /- (embedded in the activity budget)

5. ESMP Implementation Arrangements

The implementation of project activities will be carried out by the BFL focal person in BC 4. 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 contract that the BC will sign with the Contractor(s) for implementation of the planned activities in BC 4 in 2022. The Contractor 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 (e.g., letter asking the municipality for disposal of inert waste, records on OHS information session performed for all workers before start of activities, all developed EHS plans, etc.). An OHS information session should be organized by the Contractor for all workers prior start the project activities and prior any specific tasks with high health risks.

The BC 4 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-compliances should be reported to the ESS focal immediately, and the ESS focal will report it to the PCU (M&E Officer). Each non-compliance should be closed with appropriate measure/s and the evidence should be kept.

Disbursement of project funds to the BC will be contingent upon their full compliance with the safeguard's requirements.

• ESMP Monitoring Arrangements

The BFL focal person in BC 4 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.

BC 4 is also fully responsible for the compliance of all external contractors and service providers working in the BC 4 with the safeguard's requirements outlined in the ESMP.

The monitoring of activities under this ESMP will be carried out in the following manner:

SI#	Activities	Monitoring team	Timeline		Location	Means of Verification
			Start	Complete		
1	Improvement of low grassland at Pirchen by removing unwanted invasive alien species and promoting grass growth by controlled patch burning	Field Focal	Jan 2022	March 2022	Pirchen, Zhemgan g Forest Division	Activity completion report and field visit
		ESS focal	Jan 2022	Jan 2022		

Activity 1. Improvement of low grassland at Pirchen

Monitoring by implementing entities:

- Field visits at least twice - during the intervention and then monthly as part of the "SMART patrolling" activity (please adapt based on field conditions, and also based on the availability of SMART patrolling activities) – January - March, 2022
- Reports by the implementing entities submitted to ESS focal during the intervention and then after the intervention completion - January 2022 and March, 2022

Monitoring by ESS officer:

- Field visits by ESS focal - at least once during the intervention - January 2022
- Reports by ESS focal to the PCU (M&E officer) - within two weeks after the field visit and for semi-annual reporting - September 2022 and December 2022

Annual Reports by PCU (M&E officer) to Secretariat by January, 2023

Annual reports of the Secretariat to WWF US (as part of mid-year and final APR)

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 this activity is as below:

SI#	Activity	Amount (Nu.)	Budget for ESS mitigation
1	Improvement of low grassland at Pirchen by removing unwanted invasive alien species and promoting grass growth by controlled patch burning	Nu.200000.00	Nu.50000.00 (embedded in the activity budget)

8. Consultation and Disclosure Mechanisms

This ESMP is prepared by BC 4 implementing entity under the supervision of Chief Forestry Officer of Zhemgang Forest Division.

There is no community within the periphery of the activity area and consultation with the community is not necessary. The only cattle herder using this grassland was already consulted about the activity and was very much happy to promote it as grassland for wildlife and for his cattle.

The full English version of this ESMP, as well as an executive summary in Bhutanese, shall be disclosed on the website of MoAF, BFL and WWF, Bhutan Program. Hard copies of the ESMP should also be available at the PA Management Office and at the PCU Office.

9. Stakeholder Engagement Plan

The local community that resides in the vicinity of the activity area will be engaged for implementation of the activity as a physical labour. This activity will be executed within 1st quarter of year 2022.

BFL: 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)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 climatic conditions, 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. 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 within and around the construction sites.
- 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.
- Facilities shall be equipped 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.
- Fire exits should be identified and marked in Dzongkha and English- all workers should be made aware of the fire exits.

Lavatories and Showers

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

¹

<https://www.ifc.org/wps/wcm/connect/1d19c1ab-3ef8-42d4-bd6b-cb79648af3fe/2%2BOccupational%2BHealth%2Band%2BSafety.pdf?MOD=AJPERES&CVID=1s62x8l>

Potable Water Supply

- Adequate supplies of clean 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

- Workplace should receive adequate natural light and if required supplemented with artificial illumination to promote worker's safety and enable safe equipment operation.
- Emergency lighting of adequate intensity should be provided in case of failure of the powerline.

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 need to be provided where ever necessary, if there is risk of falling of overhead object.
- 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.
- Each first aid box or a cupboard shall be distinctly marked "FIRST AID"

Air Supply

- Workplace should have adequate ventilation for fresh air

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

2. 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.
3. 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 90 dB(A) for a duration of more than 8 hours per day without wearing ear plugs/ear muffs.
- Exposures to impulsive or impact noise shall not exceed 140dB(A).
- For every 3 dB(A) increase in sound levels from the permissible limit of noise, the 'allowed' exposure period or duration should be reduced by 50 percent.

- Where it is not practicable to reduce the noise, the employer must limit the duration of time persons employed or working in the workplace are exposed to the noise so that such persons are not exposed to excessive noise.
- 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

In any workplace where persons are at work in any process or operation which involves exposure to vibration which may constitute a risk to their health, it shall be the duty of the employer to provide, so far as is reasonably practicable, effective means to reduce the vibration.

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
- Conducting detailed identification and marking of all buried electrical wiring prior to any excavation work
- Every person who is working on an electric supply line or apparatus or both shall be provided with tools and devices such as gloves, rubber shoes, and safety belts, ladders, earthing devices, helmets, line testers, hand lines whichever is relevant for protecting him/her from mechanical and electrical injury.

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.

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.

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.

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:

- 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 (adult man- 50kg, adult female-25kg)
- 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' accommodation²

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.

² Based on Workers' accommodation: processes and standards—A guidance note by IFC and the EBRD (August 2009): https://www.ifc.org/wps/wcm/connect/60593977-91c6-4140-84d3-737d0e203475/workers_accomodation.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-60593977-91c6-4140-84d3-737d0e203475-ijetNIh

- Transport is provided to worksite safe and free if the accommodation is reasonably far from the worksite.
- The living facilities are built using adequate materials, kept in good repair and kept clean and free from waste and 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 and is regularly monitored.
- 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

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 waste collection are provided and emptied on a regular basis.

6. Rooms/dormitories facilities

- Rooms/dormitories are kept in good condition. They 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.
- Separate sleeping areas are provided for men and women.
- A separate bed is provided for every worker and use of double deck bunks is minimized.
- Workers are provided with comfortable mattresses. Workers may be expected to use their own pillows and bed linens.
- 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 and shower 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.

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.

Annex 1. 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