

Bhutan for Life
Environmental and Social Management Plan for Department of
Renewable Energy (DRE)
Year- (2021)

1. Introduction

(a). Project Background

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

BFL seeks to achieve the following objectives:

- i. Help Bhutan remain carbon neutral by increasing forest and vegetative cover within the Protected Area System;
- ii. Enhance the socio-economic wellbeing of communities in and in the vicinity of the PAS through climate-informed natural resources management;
- iii. Maintain stable, thriving and diverse populations of key species contributing toward national and global biodiversity goals;
- iv. 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 persons 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.

(d) Applicable law, policies, and regulation

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

WWF's safeguards policies that are relevant to this project are as follows: Policy on Environment and Social Risk Management; Policy on Protection of Natural Habitats; Policy on Involuntary Resettlement; Policy on Indigenous Peoples; Standard on Pest Management; Policy on Accountability and Grievance System; Standard on Physical Cultural Resources; as

well as general standards on occupational and community health and safety and on energy efficiency.

In general, RGoB's laws, policies, and guidelines are in line with the WWF's environmental and social safeguards requirements. However, there are a few differences between the two systems. With regard to environmental impacts, there are no direct contradictions between the RGoB laws and regulations and the WWF's SIPP, but the requirements of the latter are more extensive. All project activities should fully comply both with the RGoB's Regulations on the Environmental Clearance of Projects, and with the procedures and mitigation measures prescribed in this ESMF. In case that the WWF's SIPP requirements are more extensive, strict, or detailed than the RGoB legislation and policies, the former will apply to all project activities.

With regard to social impacts, the primary discrepancies between the RGoB laws and regulations and the WWF's SIPP refer to the status of non-title holders and informal land use, and the commitment to participatory decision-making processes. First, according to the WWF's SIPP, all users of land and natural resources (including people that lack any formal legal ownership title or usage rights) are eligible for 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 requires extensive community consultations as part of the development of various safeguards documents and during project activities. RGoB legislation does not include similar requirements. For the purposes of the BFL project, the provisions of the WWF's SIPP shall prevail over the RGoB legislation in all cases of discrepancy.

2. Environmental and Socio-Economic Conditions:

The Bumdeling Wildlife Sanctuary (BWS) is located in the North-eastern part of Bhutan covering an area of 1520.61 km with 420 km sq. of buffer zones ecosystem parts of Trashiyangtse, Lhuntse and Mongar Dzongkhag. The location is shown in *Figure 1* below. It shares an international border with China (Tibetan province) in the north and India and Arunachal Pradesh in the North East. It was established in 1995 in order to protect large areas of virtually untouched Eastern Himalayan ecosystem ranging from warm broadleaved forest to Alpine meadows and scree slopes. The sanctuary area ranges from an altitude of 1500 m in the Sheri chhu to over 6400m in the north. The area is mountainous and is dissected by steep sided valleys. The three main rivers in the park are the Kulong chhu in the East, the Khoma chhu in the West and Sheri chhu in the South.

The Aja Ney community is situated in the middle of the BWS at the confluence of Sherichu and Aja Chu. Most of these HHs are permanently settled and reside throughout the year. They grow potatoes and beans for self-consumption and occasionally harvests star anise which is a medical herb. People also rear cattle which supports their livelihood. Apart from that, the people in the community spend their time reciting prayers and guiding the pilgrims coming there. Aja-Ney is one of the most sacred pilgrimage sites under Shermuhung Gewog in Mongar Dzongkhag. It's located within the core zone of the Bumdeling Wildlife Sanctuary (BWS). The

nearest road leading to Aja terminates at a place called Khadrak located at about 17 km from the Shermuhung Gewog center. Thereafter, it takes around 7 hours on foot to reach the community. The Aja community comprises 4 Lhakhangs, 19 Tsamkhangs, 8 Huts, 2 Guest House, Park Guard Office and a Kitchen accumulating to 34 Households. The community has basic amenities like recently connected mobile network and stable drinking water supply. Currently, the HHs of Aja village are being provided with Solar Roof tops which are adequate for basic lightings and mobile charging purposes only. Therefore, for cooking and space heating, most of them still rely on the firewood while few who can afford it, use LPG.

Pertaining to the current financial position and magnitude of the task involved, the electrification work has been segregated into 3 phases. The maximum priority and major energy demands are from the phase 1 and therefore, requires earlier intervention compared to phase 2 and phase 3 segments. Phase 1 covers 21 households including the community guest houses, Lhakhangs and Tshamkhangs/Nomadic Huts. Therefore, a 50kW Solar PV System is being proposed at Nimathang to cater a reliable 3-phase power supply to the 21 households which falls under phase 1.

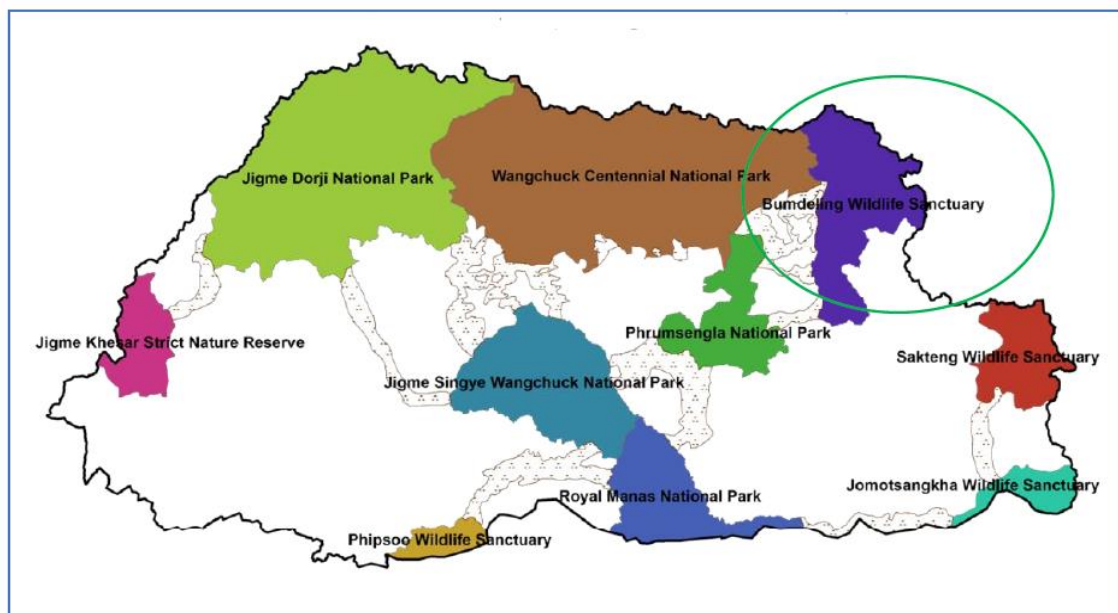


Figure-1: Location of Bumdeling Wildlife Sanctuary

(a) Geological and topographical conditions

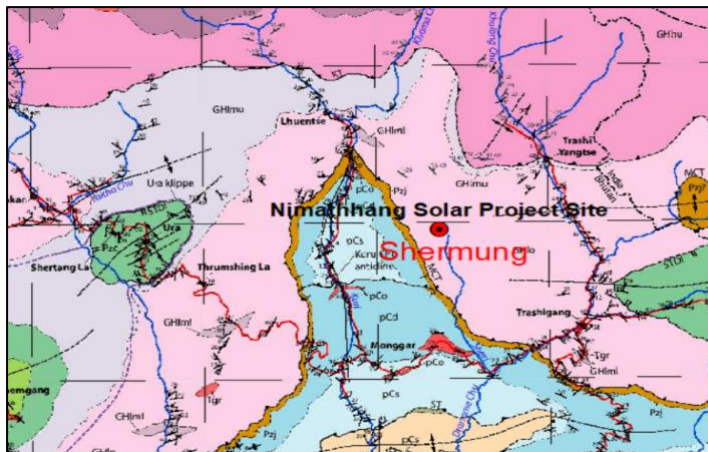


Figure-2: Geologic location of Aja Nye

As per the Geologic Map of Bhutan, Aje Nye and Nimathhang Solar Power Project in particular lies in the Orthogneiss unit (Cambrian-Ordovician) characterized by cliff-forming, massive-weathering, granite-composition orthogneiss which generally exhibits leucosomes and abundant feldspar augen with paragneiss, schist, and quartzite intervals locally splitting out. It can be also interpreted as deformed Cambrian-Ordovician

granite plutons that intruded Greater Himalayan sedimentary protoliths of 1.5-8.0 kilometre thick. (Refer Figure-2)

The identified project site is comfortably a mild slope surrounded by tropical shrubs and thinly populated trees to the one side and community households, forest guard house and open cultural (Nyes) sites to the remaining sides. However, the chosen site has adequate and extendable surrounding premises should there be any need during the implementation process.

(b) Climatic conditions

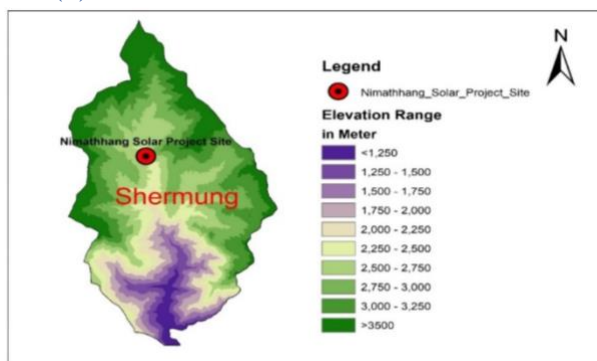


Figure-3: Elevation Range of Aja Nye

The Aja Community is situated at an elevation ranging from 2400 to 2800 m.a.s.l (Refer Fig. The major portion of the Aja village receives a good amount of sunshine throughout the year. The temperature varies from 25 Degree Celsius in the summer to -5 Degree Celsius in winter. The community is surrounded with lush green vegetation and remains cold for the majority of the months in a year. Therefore, the expected load demand for the Aja community is going to

surge from October till March and maximum demand will be during the peak winter months attributed to space heating requirement and lowest demand during mild & brief summer months. Moreover, the Aja Eco-tourism entirely operates in winter months where lots of pilgrims visit there leading to additional energy demands.

(c) Hydrological conditions

Nearby the Aja Community, there are two streams namely Ajachhu and Sherichhu. Ajachhu flows from the left side of the Pema Yang Dzong Lhakhang and joins the Sherichhu, just before the planned Solar Project Site at Nimathhang. The discharged measurement of the

Sherichhu carried out at a section just before its merging with the Ajachhu, during the site visit in November 2020 estimated a flow of 2.1 m³/sec and that of Ajachhu was found to be half the Sherichhu. Most the Nangkor Nyes were found to be located along the Ajachhu.

Since there is no rainfall station set up in the project area, the rainfall pattern of the Aja Nye can be assumed similar to that of the Mongar Dzongkhag. As per the rainfall data, it receives highest rainfall amounts, over 200 mm in a month during the summer seasons.

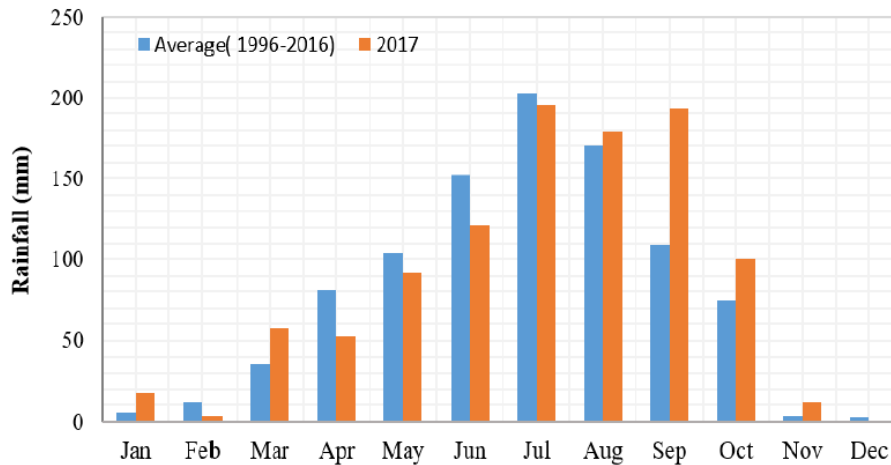


Figure 4: Monthly Average Rainfall for Mongar Dzongkhag (Source: NCHM)

(d) Flora and fauna

Aja Nye is covered by lush cool broadleaf forests. A plant known as the Star anise are found in abundant in the area which as per the local is known for its medicinal and economic value. A terrestrial orchid, locally known as Tsa-Awa-Doti is also encountered in the Aja Nye area. It is believed that the plant was blessed by Guru Rinpoche and consumption of its root is supposed to heal numerous diseases. It can be consumed either raw or soaked in water to produce an infusion that can be drunk. The list of Plant & Bird Species found at Aja Nye is attached as *Annexure-1 and 2*.

(e) Socio-economic conditions

Aja community is located within the core zone of Bumdeling Wildlife Sanctuary (BWS) with its nearest motorable road located at one day walking distance at Khadrak village. The Aja community comprises 4 Lhakhangs, 19 Tshamkhangs, 8 Huts, 2 Guest House, Park Guard Office and a Kitchen accumulating to 34 Households. Currently, the most of the households at Aja Nye are being provided with Solar Home Light Systems which are limited to basic lightings and mobile charging only. Owing to its location within the BWS, extending grid electricity was ruled out and therefore, one of the viable options to supply the community with a reliable source of electricity is installing Solar Power Plant to improve their livelihood and reduce the health risk posed by the indoor pollution due to frequent use of firewood for cooking and space heating. As the villagers have marginal land holdings (mostly of Chhoedey Tsukdey Thram) and practice subsistence farming, there is little scope for enhancing the income from agriculture.

The community has constructed few guest houses at Nimathhang as a part of Ecotourism and they are managed by the community, which serve as the shelter for the pilgrims. During the field visit in October 2020, it was observed that around four youths were found to be engaged in managing the Guest House. A Nu.100/person/day for the Guest House along with Nu.10 day for the firewood were being charged to the pilgrims to sustain their livelihood of the community besides the fee for touring around the Nyes. Considering the wide spread of pilgrimage culture in the country, the place is frequented by people all across the country during the pilgrim season. As per the community, there has been a surging number of pilgrims arriving at the camping site crossing more than 100 in numbers within a short period of time, consisting of several groups. The shortages of accommodation have been becoming a usual scene and therefore, as per the community, two additional Guest Houses will be constructed very soon to accommodate the increasing number of pilgrims.

3. Planned Activities in Year-2021

The Aja-Ney community has been deprived of grid electricity unlike the rest of the remote places in the country as it is located within the core zone of the Bumdeling Wildlife Sanctuary (BWS). The community comprises 4 Lhakhangs, 19 Tsamkhangs, 8 Huts, 2 Guest House, Park Guard Office and a Kitchen accumulating to 34 Households (HHs). Most of these HHs are permanently settled and reside at Aja throughout the year. The community has basic amenities like recently connected mobile network and stable drinking water supply. Currently, the HHs of Aja village are being provided with solar roof tops which are adequate for basic lightings and mobile charging purposes only. For cooking and space heating, most of them still rely on the firewood while few who can afford it, use LPG. Therefore, after acknowledging the hardships people undergo there, the Department initiated and explored the means to electrify the community through installation of a 50kW Solar PV Plant at Aja Ney Community.

The on-grid rural electrification program for the Aja Nye was planned in the 11th Five Year Plan (FYP). However, during the survey, it was assessed that the entire Transmission Line (TL) for taking power to Aja-Ney needs to be routed through the core zone of the Bumdeling Wildlife Sanctuary BWS). Considering the foregoing, in December 2017, the 6th Technical Advisory Committee, Department of Forest and Park Services (DoFPS) issued forestry clearance with a condition to the use of “aerial bundle cable and no felling of tree from Right of Way (RoT) clearing” to construct the TL to Aja. Since it was found technically infeasible to construct TL without felling trees, in June 2018, the DRE and BPC further requested DoFPS to revisit this specific terms and conditions, which however was not approved citing that the project area falls through the core zone of the BWS where such activities are strictly prohibited. Therefore, the Aja community has been left out from the grid electrification list during the 12th FYP period as well.

Since the on-grid electrification of Aja Community remains far from happening for the foreseeable future, the Department of Renewable Energy (DRE) is taking the lead role in propagating the electrification work at Aja community. Therefore, in order to provide the community with a sturdy and reliable energy throughout the year at the earliest possible, the

activity will be implemented in the year 2021. The budget estimation and implementation schedule are being attached here as *Annexure-3*.

The identified project site is comfortably a mild slope surrounded by tropical shrubs and thinly populated trees to the one side and community households, forest guard house and open cultural (Nyes) sites to the remaining sides. However, the chosen site has adequate and extendable surrounding premises should there be any need during the implementation process.

The identified area does not have any river/ spring, stream, water crossing / floodplain / forest, wildlife habitat / habitat of endangered/threatened/endemic species. For the distribution of the power through stringing of conductors and hoisting of poles, we need to cross rivers and clear a few trees along the route. However, this activity will have no effect on any of the habitats and watersheds as the damage caused will be very minimal and insignificant.

There is presence of religious sites nearby, however, owing to the fact that solar PV installation works are not so aggressive like other construction works and therefore, would not extend the damage beyond its identified area. The area has community guest houses and a forest guard house nearby. There would not be any better place for this particular project than the current chosen site, both in terms of technical aspects and convenient perspective.



Figure-5: Nimathhang Solar PV Project Site

The site perfectly meets the technical aspects like slope and area requirement for the installation of solar PV plants of identified capacity. Moreover, the chosen site is in the center of load and best suits for the project. The chosen site is adequate and is currently left idle.

The Solar PV installation will encompass excavation works, mounting of structures for placing the panels, building battery houses and digging trenches for laying the cables and wires. The electrical cables & wires, metallic structures, panels, batteries, CGI sheets, steel poles, GI wires, sand and cements will be the primary materials used for this project. All these materials have to be delivered to the sites through human or horse services. The ground excavation works and entire installation works will be carried out by the human labors.

The activity will involve twenty to thirty temporary workers for the transportation of materials and around ten to fifteen workers for the installation and distribution network construction

works. However, the involvement of workers may alter later during the implementation process depending on site circumstances and availability of the people. The workers will be accommodated in the community guest house equipped with proper toilets and constant running water taps which is adequate enough for hundreds of people. The immediate village to the Aja Ney community has enough young people and they in principle have agreed to render their full support particularly with regard to the labor contribution.

As discussed earlier, the phase 1 segment comprises 21 households including Lhakhang, Tsamkhangs, Huts, 2 Guest House, Park Guard Office and a Kitchen. All the households are within the vicinity of 2km radius from the activity site. The nearest road leading to Aja terminates at a place called Khadrak located at about 17 km from the Shermuhung Gewog center. Thereafter, it takes around 7 to 8 hours on foot to reach the community. Most of these HHs are permanently settled and reside at Aja throughout the year. They grow potatoes and beans for self-consumption and occasionally harvests star anise which is a medical herb. People also rear cattle which supports their livelihood.

The activity site is currently left idle and it has no direct bearing in their daily lives. The activity on this site will have no negative impact to the community as the area requirement is not very significant and moreover, the area does not have any natural resources like river, forest or there is no presence of any endangered species or wildlife habitats. This project will breed very minimal or insignificant social and environmental impacts. At a broader level, the project is rather going to complement both social and environmental related matters in the community.

However, during the installation period, there will be numbers of workers stationed at the site. The installation including the construction of transmission and distribution works is likely to take around six months and during this period, the usage of water from the existing drinking water tap is going to surge in many folds with compared to current water usage scenario. In order to avoid the water shortages in other areas and within the site, a separate water usage timetable shall be developed in consultation with the local community there and implemented as deemed appropriate.

4. Environmental and Social Impacts and Mitigation Measures

Potential impact	Impact scale	Proposed mitigation measures	Responsible party	Cost*
Activity: Installation of 50kW Solar PV Plant at Aja Ney Community				
Cutting down vegetation: cutting down of trees and other vegetation for construction purposes	Long term (Minor)	<p><i>Pre-installation:</i> Design the construction in a way that minimizes the need to cut down trees (selected proper activity sites and will ensure that damage to vegetation is minimized on selected site)</p> <p><i>During Installation:</i> Ensure that no accidental damage is caused to local vegetation</p> <p>Few trees that are supposed to be cut along the line route shall be clearly marked, and only marked trees will be cut;</p> <p><i>After Installation:</i> Replant trees after construction</p>	DRE, PMU & the selected contractor	
Noise disturbance: Possible noise disturbance as a result of outdoor equipment usage and installation works	Short term (Minor)	<p><i>Pre-installation:</i> requirements to limit noise pollution will be included in the bidding documents, as a precondition for the contractor's selection</p> <p><i>During installation:</i></p> <ul style="list-style-type: none"> Noise level control will be briefed and performed before the startup of installation activities; The equipment should be fitted with appropriate noise devices that will reduce sound level; The installation works will not be permitted during the nights, the operations on site shall be restricted to the hours 6am—7pm; Machines or equipment that are excessively noisy shall not be operated until corrective measures have been taken; 	DRE & the selected contractor	

<p>Air quality: dust as a result of installation works and possible emissions from burning firewood by the workers at site</p>	<p>Short term (Minor)</p>	<p><i>Pre-installation:</i> requirements to limit emissions will be included in the bidding documents, as a precondition for the contractor's selection</p> <p><i>During installation:</i></p> <ul style="list-style-type: none"> • Installation site, transportation routes and materials handling sites will be water-sprayed on dry and windy days; • Installation materials will be stored in appropriate and covered places to minimize dust; • Loads/materials will be covered during the transportation processes; • Workers needs to wear protective masks if dust appears; • Regular maintenance of the installation machinery/equipment will be performed in order to reduce any leakages and dispersion of pollution; • Burning of debris from ground clearance shall be prohibited. 	<p>DRE & the selected contractor</p>	
<p>Waste: generation of waste as a result of installation activities (Risk that lack of proper maintenance of the solar panels will result in environmental waste)</p>	<p>Short term (Minor)</p>	<p><i>Pre-Installation:</i> requirements for appropriate waste management will be included in the bidding documents, as a precondition for the contractor's selection</p> <p><i>During installation:</i></p> <ul style="list-style-type: none"> • Identification of the different waste types at the project site (papers, plastics, food, etc.); • Ensure that camps are located away from existing stream, river, or water sources, and that no discharge from camps is made into nearby water bodies; • Proper containers/waste bins will be provided at the project site; • Dumping of waste on the sides of the road, on private land, or in other non-designated places shall be prohibited; 	<p>DRE & the selected contractor</p>	<p>Will be met from the activity cost</p>

		<ul style="list-style-type: none"> • Dumping waste shall be prohibited on fragile slopes, forests, religious or other culturally sensitive areas or areas where livelihood is derived; • Collection, transportation and final disposal of all waste should be undertaken weekly basis; • Possible hazardous waste (damaged solar panels and batteries, machinery fuels, etc.) will be collected separately and disposed in appropriate place; • All installation materials shall be covered during the transportation to avoid waste dispersion; • The options for reuse/recycling of the generated waste streams shall be taking into consideration • Burning of construction waste shall be prohibited. <p><i>After installation:</i></p> <ul style="list-style-type: none"> • No waste shall be left behind at the project site. 		
<p>Water quality: contamination of local water sources may occur due to waste water and sewage from installation sites</p>	Short term (Minor)	<p><i>Pre-Installation:</i> requirements for appropriate measures to prevent water contamination will be included in the bidding documents, as a precondition for the contractor's selection</p> <p><i>During Installation:</i></p> <ul style="list-style-type: none"> • An environment-friendly toilet (e.g., pit toilet) and washing facilities shall be made available, built with locally available materials; • Open defecation in the vicinity of project sites shall be prohibited; • Throwing waste in water sources shall be prohibited; • Possible hazardous waste (motor oils, machinery fuels, lubricants) will be collected separately for the final and appropriate disposal; 	DRE & the selected contractor	

		<i>After installation</i> <ul style="list-style-type: none"> ● Pit toilets will be dismantled and pits shall be covered properly ● All waste shall be removed from the project site 		
<i>Soil erosion, landslides and flooding</i>	Short term (Minor)	<i>Pre-installation:</i> Sites are prone to soil erosion or landslides shall be avoided, to the extent possible <i>During installation:</i> <ul style="list-style-type: none"> ● Installation works will be limited to the non-monsoon season; ● Retention structures shall be constructed, to the extent possible using environmentally friendly materials, if ever needed; ● Plantation of bamboo trees or other plants and species that support land retention; ● The area of ground clearance shall be minimized; ● Avoid sensitive alignments, such steep hillsides and ecological sensitive areas; ● Balance filling and cutting requirements through proper route choice; ● Maintain trail surface and alignment with vegetation and where possible install slope protection 	DRE & the selected contractor	
<i>Human-wildlife conflict:</i>	Short term (Minor)	<i>During installation:</i> Proper signs shall be placed in the vicinity of project sites Project site area shall be clearly demarcated and workers shall not be allowed to enter any wildlife areas Feeding animals shall be prohibited	DRE & the selected contractor	
<i>Social impacts</i>				

<i>Disturbance of traditional ways of life and local culture:</i> as a result of site selection and/or installation activities	Long term (Minor)	<ul style="list-style-type: none"> • Carry out consultations with the communities and local government before and during installation activities to mitigate any adverse impacts on the community • Avoid sites that are in close proximity to monasteries or other sacred sites • Redesign installation plans as needed to avoid obstruction (e.g., to avoid view disturbance of a monastery) 	DRE & the selected contractor	
<i>Community access to livelihood is restricted</i>	Short term	<ul style="list-style-type: none"> • 		
<i>Access to and usage of water sources during the construction phase</i>	Short term (only for the duration of the construction: Minor)	Prepare a water management plan in consultation with local community to ensure that community's access to water sources is not disturbed, and usage of water sources is fairly allocated between local communities and construction workers (e.g., by specifying water usage times for workers).	DRE & the selected contractor	
<i>Worker's health and safety including COVID</i> <i>Refer to the full OHS guidelines attached where ever relevant)</i>	Short term (Minor)	<ul style="list-style-type: none"> • Comply with the workers' health and safety guidelines • Ensure regular health screening for the workers pre and during transportation and installation activities • Ensure that no underage workers, or children are engaged • Ensure decent work conditions, including an appropriate salary, working hours, accommodation and food for workers • Ensure that workers are employed on the principle of equal opportunity and fair treatment • Implement a grievance mechanism for workers (and their organizations, where they exist) to raise workplace concerns 	DRE & the selected contractor	

		<ul style="list-style-type: none"> Strictly abide by COVID prevention protocols (use masks, maintain distance, wash hands regularly etc.) 		
<i>Local community's health and safety</i>	Short term (Minor)	<ul style="list-style-type: none"> Ensure the safety of all project-related equipment Minimize the use of hazardous materials, and ensure that community members are not exposed to them. In case that the use of such materials is necessary, provide sufficient notice to local community members and inform them on safety and protection measures. Avoid dumping any waste or otherwise contaminating community sources of water supply and water quality. Provide information to local communities on installation activities and plans 	DRE & the selected contractor	
<i>Conflict between temporary workers and local communities</i>	Short term (Minor)	<ul style="list-style-type: none"> Workers shall be made aware of local culture and traditions, as well as the legal consequences of harassment and intimidation, especially with regards to sexual harassment and gender-based violence. Local communities shall be made aware of the engagement of temporary workers in project sites. Strict monitoring shall be carried out to ensure conflicts are minimized Local workers shall be encouraged to participate 	DRE & the selected contractor	

** Please specify the implementation costs of the requested mitigation measures and the source of funding (embedded into the activity or from BFL's separate ESS funds)*

5. ESMP Implementation Arrangements

The implementation of project activities will be carried out by the Department of Renewable Energy. The Project Manager, DRE and ESS Focal, BFL shall 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 PA will sign with the Contractor(s) for implementation of the planned activities in BWS in 2021. 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.

The Project Manager, DRE/ ESS Focal, BFL shall 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 officer immediately, and the ESS officer 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 PA will be contingent upon their full compliance with the safeguard's requirements.

6. ESMP Monitoring Arrangements

The Project Manager, DRE/ BFL focal person in BWS 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.

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

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

SN	Activities	Monitoring team	Timeline		Location	Means of Verification
			Start	Complete		
1	Installation of 50kW Solar PV plant at Aja Ney Community	Field focals	November 2021	September 2022	Aja Ney, BWS	Implementation Report (Monthly Report and Annual Completion Report)
2		ESS officer	March 2022			Monitoring report

- Monitoring by implementing entities:
 - At least weekly field visits
 - Monthly reports prepared by implementing entities and submitted to ESS officer
- Monitoring by ESS officer:
 - Field monitoring by ESS officer – monitoring of the work once during the implementation and through field report from IAs after completion of the work.
 - Reports by ESS officer to BFL Fund Secretariat – Annual report submitted to the BFL Fund Secretariat in January, 2022.

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

7. Capacity Need and Budget

Activities under this ESMP will be implemented by the Department of Renewable Energy and shall be contracted to the competent and qualifying bidder/s. The project shall require solar installation expertise and as well as experienced electrical and civil engineers in the field of transmission and distribution system. The competency and expertise of the human resource shall be made mandatory in the bidding document and will be strictly monitored.

The budget for each activity is as follows:

1. Procurement of Materials: Nu. 9.69 Million
2. Transportation/Installation: Nu. 1.94 Million
3. Project Administration Cost: Nu. 0.5 Million

As indicated earlier, the budget utilization plan and corresponding work schedule is also being attached here.

8. Consultation and Disclosure Mechanisms

This ESMP has been prepared in a participatory manner, and a community consultation was carried out in November 2020 to inform local communities regarding the planned project activities, solicit their opinions, and enable them to question proposed mitigation measures. There were no issues as such but the communities all agreed on giving the clearance to construct the Solar PV farm as the need for the electricity has become quite imperative and urgent.

The Department also sought the no objection letter from the community for the installation of a solar PV system at Aja Ney. The public clearance letter is being attached here as *Annexure*

Gist of the No Objection Letter Provided by the Gewog Administration which is in national language have been translated in English as follows:

The Shermuhung Gewog Administration would like to thank the Department of Renewable Energy, Ministry of Economic Affairs for this initiative of installing the solar PV plant that would cater equivalent energy just like what rest of the places gets through the grid electricity. The Aja Ney community has been long deprived of the basic lighting facility through the grid extension due to its location (BWS). However, this initiative will definitely ensure the

comfortability and convenience to the lives of the people living there. This project is not only going to bring huge relief and sigh to the people of the community but also shall extend the benefits to the annual pilgrims visiting the place from elsewhere.

Therefore, the community have no objection even if the erection of electric poles and stringing of cables falls/passes through their private land. The six representatives from the community hereby would like to provide the full assurance to support and comply with the words they have provided during the consultation phase through signing this no objection letter

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 planned activity will be engaged throughout the implementation of these activities. The activity includes transportation of materials to the site, installation works and construction of distribution networks (erecting of poles and stringing of conductor cables).

The BFL focal person has to submit the official minutes of consultation meetings (along with a list of participants, disaggregated by gender and age) to ESS officer within one week after the completion of the consultation. The ESS officer will submit the consultation reports to the PCU (M&E officer) one week after their receipt. The PCU (M&E officer) will report to the Secretariat on a semi-annual basis.

Annexure 1: List of Plant species recorded at Aja Nye

SN.	Species (Botanical Name)	SN	Species (Botanical Name)
1	<i>Acer campbellii</i>	23	<i>Musa griersonii</i>
2	<i>Alcimandra cathcartii</i>	24	<i>Myricasculanta</i>
3	<i>Bamboosp(Chimonobambusa callosa)</i>	25	<i>Myrsine semiserrata</i>
4	<i>Berberis angulosa</i>	26	<i>Nyssa javanica</i>
5	<i>Beilscimiedia sp</i>	27	<i>Parasassafras confertiflora</i>
6	<i>Betula alnoides</i>	28	<i>Phoeasp</i>
7	<i>Castanopsis tribuloides</i>	29	<i>Pinus bhutanica</i>
8	<i>Daphne bholua</i>	30	<i>Prunuscerasoides</i>
9	<i>Daphnephylum himalayansis</i>	31	<i>Prunus nepaulensis</i>
10	<i>Dichroa febrifuga</i>	32	<i>Quercusgriffithii</i>
11	<i>Docynia indica</i>	33	<i>Quercus lamellosa</i>
12	<i>Eurya acuminate</i>	34	<i>Quercus oxyodon</i>
13	<i>Ficus numularia</i>	35	<i>Rhododendron grande</i>
14	<i>Ficus roxburghii</i>	36	<i>Rhododendron niveum</i>

15	<i>Fraxinus floribunda</i>	37	<i>Sorbus cuspidata</i>
16	<i>Gaultheria fragrantissima</i>	38	<i>Skimmia luareola</i>
17	<i>Hypericum sp</i>	39	<i>Symplocossp</i>
18	<i>Illicium griffithii</i>	40	<i>Tetradium fraxinifolium</i>
19	<i>Indigifera dousa</i>	41	<i>Trevesia palmate</i>
20	<i>Juniperus sp</i>	42	<i>Tsuga domusa</i>
21	<i>Lyonia ovalifolia</i>	43	<i>Viburnum erubescens</i>
22	<i>Magnolia campbellia</i>	44	<i>Wenlandia luzoniensis</i>

Source: <http://www.moaf.gov.bt/report-on-aja-nye-and-nye-chen-phunyingla/>

Annexure-2: List of Bird species recorded at Aja Nye

Sl.No.	Species (Scientific Name)	Common Name
1	<i>Abroscopus schisticeps</i>	Black-faced Warbler
2	<i>Actinodura egeroni</i>	Rusty-fronted Barwing
3	<i>Actinodura nipalensis</i>	Hoary-throated Barwing
4	<i>Aegithalos concinus</i>	Black-throated Tit
5	<i>Aegithalos iouschistos</i>	Rufous-fronted Tit
6	<i>Aethopyga nipalensis</i>	Green-tailed Sunbird
7	<i>Alcippe nipalensis</i>	Nepal Fulvetta
8	<i>Anthus hodgsoni</i>	Olive-backed Pipit
9	<i>Arborophila rufogularis</i>	Rufous-throated Partridge
10	<i>Arborophila torqueola</i>	Hill Partridge
11	<i>Blythipicus pyrrhotis</i>	Bay Woodpecker
12	<i>Brachypteryx montana</i>	White-browed Shortwing
13	<i>Buteo burmanicus</i>	Himalayan Buzzard
14	<i>Carduelis spinoides</i>	Yellow-breasted Greenfinch
15	<i>Certhia discolor</i>	Brown-throated Treecreeper
16	<i>Certhia hodgsoni</i>	Hodgson's Treecreeper
17	<i>Certhia nipalensis</i>	Rusty-flanked Treecreeper
18	<i>Cettia brunnifrons</i>	Grey-sided Bush Warbler
19	<i>Cettia fortipes</i>	Brown-flanked Bush Warbler
20	<i>Chaimarrornis leucocephalus</i>	White-capped Water Redstart
21	<i>Chelidonyx hypoxantha</i>	Yellow-bellied Fantail
22	<i>Chloropsis hardwickii</i>	Orange-bellied Leafbird
23	<i>Cinclus pallasii</i>	Brown Dipper
24	<i>Cissa chinensis</i>	Common Green Magpie
25	<i>Columba hodgsonii</i>	Speckled Wood Pigeon
26	<i>Coracina melaschistos</i>	Black-winged Cuckooshrike

27	<i>Corvus macrorhynchos</i>	Large-billed Crow
28	<i>Culicicapa ceylonensis</i>	Grey-headed Canary Flycatcher
29	<i>Cutia nipalensis</i>	Himalayan Cutia
30	<i>Dendrocitta formosae</i>	Grey Treepie
31	<i>Dendrocopos darjellensis</i>	Darjeeling Woodpecker
32	<i>Dendrocopos hyperythrus</i>	Rufous-bellied Woodpecker
33	<i>Dicaeum ignipectus</i>	Fire-breasted Flowerpecker
34	<i>Dicrurus hottentottus</i>	Spangled Drongo
35	<i>Dicrurus leucophaeus</i>	Ashy Drongo
36	<i>Dicrurus remifer</i>	Lesser Racket-tailed Drongo
37	<i>Emberiza pusilla</i>	Little Bunting
38	<i>Enicurus maculatus</i>	Spotted Forktail
39	<i>Enicurus schistaceus</i>	Slaty-backed Forktail
40	<i>Enicurus scouleri</i>	Little Forktail
41	<i>Erpornis zantholeuca</i>	White-bellied Erpornis
42	<i>Falco tinnunculus</i>	Common Kestrel
43	<i>Ficedula strophilata</i>	Rufous-gorgeted Flycatcher
44	<i>Ficedula tricolor</i>	Slaty-blue Flycatcher
45	<i>Fulvetta vinipectus</i>	White-browed Fulvetta
46	<i>Galucidium cuculoides</i>	Asian Barred Owlet
47	<i>Garrulax affinis</i>	Black-faced Laughingthrush
48	<i>Garrulax albogularis</i>	White-throated Laughingthrush
49	<i>Garrulax caeruleus</i>	Grey-sided Laughingthrush
50	<i>Garrulax erythrocephalus</i>	Chestnut-crowned Laughingthrush
51	<i>Garrulax imbricatus</i>	Bhutan Laughingthrush
52	<i>Garrulax leucolophus</i>	White-crested Laughingthrush
53	<i>Garrulax ocellatus</i>	Spotted Laughingthrush
54	<i>Garrulax ruficollis</i>	Rufous-necked Laughingthrush
55	<i>Garrulax squamatus</i>	Blue-winged Laughingthrush
56	<i>Garrulax striatus</i>	Striated Laughingthrush
57	<i>Garrulax subunicolor</i>	Scaly Laughingthrush
58	<i>Garrulus glandarius</i>	Eurasian Jay
59	<i>Glaucidium brodiei</i>	Collared Owlet
60	<i>Gyps himalayensis</i>	Himalayan Vulture
61	<i>Haematospiza sipahi</i>	Scarlet Finch
62	<i>Hypsipetes leucocephalus</i>	Black Bulbul
63	<i>Indicator xanthonotus</i>	Yellow-rumped Honeyguide

64	<i>Ixos mcclellandii</i>	Mountain Bulbul
65	<i>Lanius schach</i>	Long-tailed Shrike
66	<i>Leiothrix lutea</i>	Red-billed Leiothrix
67	<i>Liocichla phoenicea</i>	Red-faced Liocichla
68	<i>Lioparus chrysotis</i>	Golden-breasted Fulvetta
69	<i>Lophophanes dichrous</i>	Grey-crested Tit
70	<i>Lophura leucomelanos</i>	Kalij Pheasant
71	<i>Macropygia unchall</i>	Barred Cuckoo Dove
72	<i>Malacias capistratus</i>	Rufous Sibia
73	<i>Megalaima franklinii</i>	Golden-throated Barbet
74	<i>Megalaima virens</i>	Great Barbet
75	<i>Melanochloa sultanea</i>	Sultan Tit
76	<i>Micropternus brachyurus</i>	Rufous Woodpecker
77	<i>Minla ignotincta</i>	Red-tailed Minla
78	<i>Monticola cinclorhynchus</i>	Blue-capped Rock Thrush
79	<i>Monticola rufiventris</i>	Chestnut-bellied Rock Thrush
80	<i>Motacilla alba</i>	White Wagtail
81	<i>Motacilla cinerea</i>	Grey Wagtail
82	<i>Mycerobas melanozanthos</i>	Spot-winged Grosbeak
83	<i>Myophonus caeruleus</i>	Blue Whistling Thrush
84	<i>Nicifraga multipunctulata</i>	Spotted Nutcracker
85	<i>Niltava grandis</i>	Large Niltava
86	<i>Niltava macgrigoriae</i>	Small Niltava
87	<i>Niltava sundara</i>	Rufous-bellied Niltava
88	<i>Ninox nivicola</i>	Himalayan Wood Owl
89	<i>Nisaetus nipalensis</i>	Mountain Hawk Eagle
90	<i>Oligura castaneocoronata</i>	Chestnut-headed Tesia
91	<i>Oriolus trailli</i>	Maroon Oriole
92	<i>Orthotomus sutorius</i>	Common Tailorbird
93	<i>Parus monticolus</i>	Green-backed Tit
94	<i>Parus spilonotus</i>	Yellow-cheeked Tit
95	<i>Passer rutilans</i>	Russet Sparrow
96	<i>Pericrocotus brevirostris</i>	Short-billed Minivet
97	<i>Pericrocotus ethologus</i>	Long-tailed Minivet
98	<i>Pericrocotus solaris</i>	Grey-chinned Minivet
99	<i>Pericrocotus speciosus</i>	Scarlet Minivet
100	<i>Periparus ater</i>	Coal Tit

101	<i>Periparus rubidiventris</i>	Rufous-vented Tit
102	<i>Phoenicurus frontalis</i>	Blue-fronted Redstart
103	<i>Phoenicurus hodgsoni</i>	Hodgson's Redstart
104	<i>Phyllergates cuculatus</i>	Mountain Tailorbird
105	<i>Phylloscopus cantator</i>	Yellow-vented Warbler
106	<i>Phylloscopus chloronotus</i>	Lemon-rumped Warbler
107	<i>Phylloscopus maculipennis</i>	Ashy-throated Warbler
108	<i>Phylloscopus mafnirostris</i>	Large-billed Warbler
109	<i>Phylloscopus pulcher</i>	Buff-barred Warbler
110	<i>Phylloscopus reguloides</i>	Blyth's Leaf Warbler
111	<i>Phylloscopus trochiloides</i>	Greenish Warbler
112	<i>Picumnus innominatus</i>	Speckled Piculet
113	<i>Picus canus</i>	Grey-headed Woodpecker
114	<i>Picus chlorolophus</i>	Lesser Yellownape
115	<i>Picus flavinucha</i>	Greater Yellownape
116	<i>Pnoepyga albiventer</i>	Scaly-breasted Wren Babbler
117	<i>Pnoepyga pusilla</i>	Pygmy Wren Babbler
118	<i>Pomatorhinus erythrogenys</i>	Rusty-cheeked Scimitar Babbler
119	<i>Pomatorhinus ruficollis</i>	Streak-breasted Scimitar Babbler
120	<i>Pomatorhinus schiticep</i>	White-browed Scimitar Babbler
121	<i>Prunella immaculata</i>	Maroon-backed Accentor
122	<i>Prunella strophciata</i>	Rufous-breasted Accentor
123	<i>Pseudominla castaneiceps</i>	Rufous-winged Fulvetta
124	<i>Pseudominla cinerea</i>	Yellow-throated Fulvetta
125	<i>Pteruthius melanotis</i>	Black-eared Shrike-Babbler
126	<i>Pteruthius xanthochlorus</i>	White-browed Shrike-Babbler
127	<i>Pycnonotus cafer</i>	Red-vented Bulbul
128	<i>Pycnonotus leucogenys</i>	Himalayan Bulbul
129	<i>Pycnonotus striatus</i>	Striated Bulbul
130	<i>Pyrrhoptes epauletta</i>	Gold-naped Finch
131	<i>Pyrrhula erythrocephala</i>	Red-headed Bullfinch
132	<i>Rhipidura albicollis</i>	White-throated Fantail
133	<i>Rhyacornis fuliginosa</i>	Plumbeous Water Redstart
134	<i>Sasia ochracea</i>	White-browed Piculet
135	<i>Saxicola ferreus</i>	Grey Bushchat
136	<i>Seicercus affinis</i>	White-spectacled Warbler
137	<i>Seicercus burkii</i>	Green-crowned Warbler

138	<i>Seicercus castniceps</i>	Chestnut-crowned Warbler
139	<i>Seicercus poliogenys</i>	Grey-cheeked Warbler
140	<i>Seicercus whistleri</i>	Whistler's Warbler
141	<i>Sitta himalayensis</i>	White-tailed Nuthatch
142	<i>Siva cyanouroptera</i>	Blue-winged Siva
143	<i>Sivastrigula</i>	Bar-throated Siva
144	<i>Spilornis cheela</i>	Crested Serpent Eagle
145	<i>Stachyridopsis chrysaea</i>	Golden Babbler
146	<i>Stachyridopsis ruficeps</i>	Rufous-capped Babbler
147	<i>Streptopelia chinensis</i>	Spotted Dove
148	<i>Streptopelia orientalis</i>	Oriental Turtle Dove
149	<i>Sylviparus modestus</i>	Yellow-browed Tit
150	<i>Tarsiger chrysaeus</i>	Golden Bush Robin
151	<i>Tarsiger rufilatus</i>	Himalayan Bluetail
152	<i>Tesia olivea</i>	Slaty-bellied Tesia
153	<i>Tichodromamuraria</i>	Wallcreeper
154	<i>Tickelliahodgsoni</i>	Broad-billed Warbler
155	<i>Tragopan satyra</i>	Satyr Tragopan
156	<i>Troglodytes troglodytes</i>	Eurasian Wren
157	<i>Turdus albocinctus</i>	White-collared Blackbird
158	<i>Turdus bouboul</i>	Grey-winged Blackbird
159	<i>Urocissa flavirostris</i>	Yellow-billed Blue Magpie
160	<i>Xiphirhynchus superciliosus</i>	Slender-billed Scimitar Babbler
161	<i>Yuhina flavicollis</i>	Whiskered Yuhina
162	<i>Yuhina gularis</i>	Stripe-throated Yuhina
163	<i>Yuhina nigrimenta</i>	Black-chinned Yuhina
164	<i>Yuhina occipitalis</i>	Rufous-vented Yuhina
165	<i>Zoothera dixonii</i>	Long-tailed Thrush
166	<i>Zoothera mollissima</i>	Plain-backed Thrush

Source: <http://www.moaf.gov.bt/report-on-aja-nye-and-nye-chen-phunyingla/>

Annexure 3: Project Implementation and Budget Utilization Plan.

Project Implementation and Budget Utilization Plan																									
Sl#	Activities	Month, 2021												Month ,2022											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
BUDGET (Nu.)					969,627.90			8,726,651.10			581,776.80			775,702.40			581,776.80			250,000.00			250,000.00		
1	Signing of Tri-party agreement and establish Project Management Unit (PMU)																								
2	Installation of 50 kW Solar PV Plant at Aja Community (Solar Power Plant at Nimathang)																								
2.1	Design and Engineering																								
2.2	Prepare Bill of Quantity																								
2.3	Cultural, Public, Land Acquisition etc)																								
2.4	Evaluation & Awarding)																								
2.5	Inspection/procurement of equipment and materials																								
2.6	Delivery of materials to the sites																								
2.7	Installation, Testing & Commissioning																								
2.8	Capacity Building (Training on Operation and Maintenance)																								

ପ୍ରାୟ: ୦୮/୦୮/୨୦୨୦

အနက်ရှင်းပြောဆိုသည့်အတိုင်း အကျိုးရှိစေရန် ခြိမ်းခြောက်မှုများ ပြုလုပ်ခဲ့သည်။

[illegible]



Gup
Gewog Administration
Sheri : Bhutan

Email-Kinleyw@mongar.gov.bt/sgyal123@gmail.com

ཕྱི་ཚེས་ 04/04/2020 ལ།

མི་ལྟོ་རྒྱུ་ཡིག་ལྷན་པ།

༣ རྒྱལ་ཁབ་ཚོགས་པ་ ཆེད་པ་རྟོ་རྟེན་ཆེད་ཚུ་ལྷན་པ་ལྷན་པ། དེ་ནི་ ད་པེ་ ས་གནས་ལྷན་པ་ཆེད་ཚུ་ལྷན་པ་
ལྷན་པ་ལྷན་པ་ རྟོ་རྟེན་ཆེད་ཚུ་ལྷན་པ་ལྷན་པ་ ལྷན་པ་ལྷན་པ་ལྷན་པ་ལྷན་པ་ ལྷན་པ་ལྷན་པ་ལྷན་པ་ ལྷན་པ་ལྷན་པ་
ཆེད་པ་ལྷན་པ་ ལྷན་པ་ལྷན་པ་ལྷན་པ་ལྷན་པ་ ལྷན་པ་ལྷན་པ་ལྷན་པ་ ལྷན་པ་ལྷན་པ་ལྷན་པ་ ལྷན་པ་ལྷན་པ་
ལྷན་པ་ལྷན་པ་ ལྷན་པ་ལྷན་པ་ལྷན་པ་ལྷན་པ་ ལྷན་པ་ལྷན་པ་ལྷན་པ་ ལྷན་པ་ལྷན་པ་ལྷན་པ་ ལྷན་པ་ལྷན་པ་
ལྷན་པ་ལྷན་པ་ ལྷན་པ་ལྷན་པ་ལྷན་པ་ལྷན་པ་ ལྷན་པ་ལྷན་པ་ལྷན་པ་ ལྷན་པ་ལྷན་པ་ལྷན་པ་ ལྷན་པ་ལྷན་པ་



༤ ཆེད་པ་རྟོ་རྟེན་ རྒྱལ་ཁབ་ཚོགས་པ་ རྟོ་

Jabgang Tshogpa
Shelrimuhung Gewog
Mongar : Bhutan

[illegible]

ମୂଳ ଶାସ୍ତ୍ରମାନଙ୍କର ବିଶିଷ୍ଟତା

[illegible]

ਪ੍ਰਸਤੁਤ ਕੀਤਾ ਪ੍ਰਮਾਣਿਕ ਹੋ ਗਿਆ ਅਭਿਨੰਦਨ ਆਪਣੇ ਸ਼੍ਰੀ ਮਾਤਾ

[illegible]

ಶ್ರೀ ಶ್ರೀಮದ್ಭೂಮಿಪುಷ್ಪಾಕ್ಷಯಾ ನಮಃ ಶ್ರೀಮದ್ಭೂಮಿಪುಷ್ಪಾಕ್ಷಯಾ ನಮಃ

ಗೌರವಾನ್ವಿತರುಗಳಿಗೆ ಸಿರಿವಂತಿಕೆಗೆ, ಆರೋಗ್ಯಕ್ಕೆ, ಶಾಂತಿ ಮತ್ತು ಸಮೃದ್ಧಿಯನ್ನು ಕೋಶಿಸುತ್ತೇನೆ.

[illegible][illegible]

(အိဉ်ကတၢ်တၢ်ဒုၤအံၤတၢ်ဒုၤ)

၇၄- ဇေယျာနာယောဉ္ဇနိ = အတ္တဉ္ဇနိ ဥပသုဒ္ဓါယနာယောဉ္ဇနိ

२८- अक्षयप्रभातः = = शुद्धशुक्लपक्षे शुभशुभशुभशुभ

ଉତ୍ତର :- ଶ୍ରୀମଦସ୍ତୋତ୍ରାଂ ସର୍ଗପ୍ରଥମାୟ ନମଃ ।

Ex - $\frac{1}{x^2} = x^{-2}$

৭- মধ্যমীয়া ক্রিয়া = মধ্যমীয়া ক্রিয়া

Q- $\frac{1}{\sqrt{1-x^2}} = \frac{1}{\sqrt{1-x^2}}$

Annexure . 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)¹ and the Occupational Health and Safety Guidelines of Bhutan's Construction Development Corporation Ltd., which relies on the national Regulation on Occupational Health, Safety and Welfare 2012, Regulation on Working Conditions 2012 and Labour Act 2007, and in compliance to Sl. No. 21 of Regulation on Occupational Health, Safety and Welfare 2012.

1. General Facility Design and Operation

Integrity of Workplace Structures

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

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

Severe Weather and Facility Shutdown

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

Workspace and Exit

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

Fire Precautions

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

- The workplace shall be provided with adequate means of protection and escape in case of fire.
- The workplace shall be provided with adequate number of relevant fire extinguishers.
- Workers shall wear shoes without iron or steel nails or any other exposed ferrous materials which is likely to cause sparks by friction.
- Smoking, lightening, or carrying of matches, lighters or smoking materials shall be prohibited.
- All other precautions, as are reasonably practicable, shall be taken to prevent initiation of ignition from all other possible sources such as open flames, frictional sparks, overheated surfaces of machinery or plant, chemical or physical, chemical reaction and radiant heat.
- At every workplace adequate provision of water supply for firefighting shall be provided and maintained.

- Equipping facilities with firefighting equipment (e.g., fire extinguishing bottle). The equipment should be maintained in good working order and be readily accessible. It should be adequate for the dimensions and use of the premises, equipment installed, physical and chemical properties of substances present, and the maximum number of people present.
- Manual firefighting equipment shall be easily accessible and simple to use.
- Fire extinguishers and emergency alarm systems that are both audible and visible should be in place.

Lavatories and Showers

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

Potable Water Supply

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

Clean Eating Area

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

Lighting

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

Safe Access

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

First Aid

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

Work Uniform

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

Air Supply

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

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

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

3. Physical Hazards

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

Rotating and Moving Equipment

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

protective measures include:

- Designing machines to eliminate trap hazards and ensuring that extremities are kept out of harm's way under normal operating conditions. Examples of proper design considerations include two-hand operated machines to prevent amputations or the availability of emergency stops dedicated to the machine and placed in strategic locations.
- Where a machine or equipment has an exposed moving part or exposed pinch point that may endanger the safety of any worker, the machine or equipment should be equipped with, and protected by, a guard or other device that prevents access to the moving part or pinch point. Guards should be designed and installed in conformance with appropriate machine safety standards.

Noise

- No worker should be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. In addition, no unprotected ear should be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C).
- The use of hearing protection should be enforced actively when the equivalent sound level over 8 hours reaches 85 dB(A), the peak sound levels reach 140 dB(C), or the average maximum sound level reaches 110dB(A). Hearing protective devices provided should be capable of reducing sound levels at the ear to at least 85 dB(A).
- Although hearing protection is preferred for any period of noise exposure in excess of 85 dB(A), an equivalent level of protection can be obtained, but less easily managed, by limiting the duration of noise exposure. For every 3 dB(A) increase in sound levels, the 'allowed' exposure period or duration should be reduced by 50 percent.

- Prior to the issuance of hearing protective devices as the final control mechanism, use of acoustic insulating materials, isolation of the noise source, and other engineering controls should be investigated and implemented, where feasible.
- Periodic medical hearing checks should be performed on workers exposed to high noise levels.

Vibration

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

Electrical

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

- Marking all energized electrical devices and lines with warning signs
- Locking out (de-charging and leaving open with a controlled locking device) and tagging-out (warning sign placed on the lock) devices during service or maintenance
- Checking all electrical cords, cables, and hand power tools for frayed or exposed cords and following manufacturer recommendations for maximum permitted operating voltage of the portable hand tools
- Double insulating / grounding all electrical equipment used in environments that are, or may become, wet; using equipment with ground fault interrupter (GFI) protected circuits
- Protecting power cords and extension cords against damage from traffic by shielding or suspending above traffic areas
- Appropriate labeling of service rooms housing high voltage equipment ('electrical hazard') and where entry is controlled or prohibited
- Establishing "No Approach" zones around or under high voltage power lines
- Rubber tired construction or other vehicles that come into direct contact with, or arcing between, high voltage wires may need to be taken out of service for periods of 48 hours and have the tires replaced to prevent catastrophic tire and wheel assembly failure, potentially causing serious injury or death
- Conducting detailed identification and marking of all buried electrical wiring prior to any excavation work

Eye Hazards

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

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

Welding / Hot Work

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

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

Working Environment Temperature

Exposure to hot or cold working conditions in indoor or outdoor environments can result 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' 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.
- 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) | 19. A supply of suitable splint |
| 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) | |