



**Food and Agriculture
Organization of the
United Nations**



**Environmental and Social Impact Assessment (ESIA) and
Environmental and Social Management Plan (ESMP)
For Selected Civil Works**



FOOD SECURITY AND AGRICULTURAL PRODUCTIVITY PROJECT-ADDITIONAL FINANCING

BHUTAN MINISTRY OF AGRICULTURE AND FORESTS

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Acronyms and Glossary

Acronyms

AF	Additional Financing
AMC	Agriculture Machinery Centre
BCC	Behaviour Change Communication
BP	Bank Policy
BTN	Bhutanese Ngultrums
CA	Competent Authority
CPS	Country Partnership Strategy
CRPs	Community Resource Persons
DAMC	Department of Agriculture Marketing and Cooperatives
DAO	District Agriculture Officer
DEC	Dzongkhag Environment Committee
DoA	Department of Agriculture
DoFPS	Department of Forest and Park Services
EA	Environmental Assessment
EAA	Environmental Assessment Act
EC	Environmental Clearance
ED	Engineering Division
EIA	Environmental Impact Assessment
ESCoPs	Environmental and Social Code of Practices
ESIA	Environmental and Social Impact Assessment
ESS	Environmental and Social Screening
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
FCBL	Food Corporation of Bhutan Limited
FNCA	Forest and Nature Conservation Act
FSAPP	Food Security and Agriculture Productivity Project
GMOs	Genetically Modified Organisms
GRF	Government Reserved Forest
GVCDP	Gender and Vulnerable Communities Development Plan
ICT	Information and Communication technology
IEE	Initial Environment Examination
IESE	Initial Environmental and Social Examination
LARP	Land Acquisition and Rehabilitation Plan
MoAF	Ministry of Agriculture and Forests
NECS	National Environment Commission Secretariat
NEPA	National Environment Protection Act
NSC	National Seed Centre
OP	Operational Policy
PAN	Project Advisory Network
PAVA	Property Assessment and Valuation Authority
PDO	Project development Objectives
PMU	Project Management Unit
PPD	Policy and Planning Division
PSC	Project Steering Committee

RGoB	Royal Government of Bhutan
RNR	Renewable Natural Resources
ARDCs	Agriculture Research and Development Centres
RoW	Right of Way
RRCDP	Remote Rural Communities Development Project
TA	Technical Assistance
ToR	Terms of Reference
WA	Water Act
WB	World Bank
WHO	World Health Organization
WUAs	Water User Associations

Glossary

Chiwog	A cluster of villages
Dzongkhag	District
Gewog	A block in a District (consisting of several villages)
Gup	Elected Administrative Head of the Block
Sokshing	Plot of Forest Land Used for Leaf Litter
Mangmi	Elected Representative of the Village (Villages)
Tshogdu	Committee of Elected Representatives
Tshogpa	An Elected Representative of Village

EXECUTIVE SUMMARY

Bhutan Food Security and Agriculture Productivity Project (FSAPP) aims at increasing agricultural productivity and enhance access to markets for farmers in selected gewogs in Southwest, and South Bhutan. Several civil constructions will be undertaken under this project to achieve its objective. Construction of Cold Storage, Central Pack Houses, Field pack Houses will be done under the funding of this project.

The ESIA and the ESMP assesses the environmental and social impacts and risks due to the selected civil works related subproject interventions and provides a detailed plan to address those impacts.

The ESIA and ESMP follow a set of compliance guidance with respect to land acquisition, dust and smoke, noise and vibration, disturbance to vegetation cover, cutting trees, waste generation, water pollution, localized landslides and flooding, traffic disturbance, public health and safety, damages or disrupt operations of existing infrastructure, disturbance to socio-economic activities, social impacts related to mobilization of workers to site, and impacts on physical cultural objects were examined on-site in collaboration with respective Gewog & Dzongkhag administration. All the construction is yet to start, and technical guidance will have to be provided for implementation during construction and compliance monitoring in the future are provided in this document.

Recommendation/Follow-up

- It is recommended that ESMP be an integral part of the contractual terms and conditions between the PIUs/dzongkhags and contractors and should be included in the bidding documents and agreements drawn thereafter and should be monitored during implementation and construction of pack houses (PHs) and cold storages (CSs).
- Since the COVID-19 pandemic is to remain into unforeseeable future, strict standard operating procedures (SOP) regarding its spreading and containment to be followed.
- The SOP for pack houses and cold store is crucial for ensuring post-construction/project economic and institutional sustainability. It is, therefore, important that standard SOP be finalized and agreed for implementation and compliance monitoring between the prospective caretaker management and concerned Dzongkhag/Gewog.
- The impact assessment be implemented after completion of the projects in as shown in for impact assessment of all PHs and CSs against baseline to gauge any actual environmental and social impact on area, such as crop production, income generation from agriculture produce, food self-sufficiency status by gender.
- The project should have enough resources and monitoring and evaluation framework, pre-construction, during construction and post construction as shown on Tables 12 and 13.
- Many environmental parameters (e.g water quality, air pollution) subjectively judge, it is recommended that the project adopt standard measurement practices for at least air and water in the project areas.

1. PROJECT DESCRIPTION

The Food Security and Agriculture Productivity Project (FSAPP), executed by the Department of Agriculture, Ministry of Agriculture and Forests (MoAF), is funded by a grant amount of USD 8 million by the Global Agriculture and Food Security Program (GAFSP), and with contribution of the government and the beneficiaries, the total FSAPP budget amounts to USD 9.33 million, of which a Global Agriculture and Food Security Program (GAFSP) Grant of USD 8 million, Borrower contributions of USD 1.10 million, and Local Beneficiary contributions of USD 0.23 million. The Bhutan Food Security and Agriculture Productivity Project (FSAPP) was approved on 27 April 2017 with a closing date of 30 Dec 2022. The total cost of the parent project is USD 9.33 million. The World Bank is the supervising entity for the FSAPP. The Royal Government of Bhutan (RGoB) and FAO have signed an Agreement (UTF/BHU/013/BHU) where Technical Assistance (TA) of FSAPP (TA-FSAPP) is managed and implemented by FAO. The main outcome of the TA-FSAPP is to strengthen the capacities of FSAPP beneficiaries, MoAF staff and other project stakeholders and enable them to maximize their impacts of the project. The total TA-FSAPP budget is USD1.15 million. The FAO Country Office is supported with technical expertise from its regional office for Asia and the Pacific (RAP) in Bangkok and Headquarters, coordinated and led by the Lead Technical Officer (LTO) stationed at RAP.

The Project Development Objective (PDO) is to increase agricultural productivity and enhance access to markets for farmers in selected gewogs in Southwest Bhutan. The project supports the Royal Government of Bhutan's (RGoB) efforts to reduce rural poverty, food insecurity, and high levels of malnutrition, to increase resilience to climate change through climate smart agricultural productivity enhancement for food security and nutrition and increasing farmer's access to local and export markets. The project will reach out to 11,398 farmer households in 29 Gewogs across five Dzongkhags.

The current Additional Financing (AF) of the FSAPP has following components:

1.1 Component 1: Strengthening Farmer and Producer Groups (Original Grant: \$1.079m, AF Grant: \$0.120m) The current subcomponents include: 1.1 FG strengthening and formation, 1.2 strengthening PGs, and 1.3 contributing to improved nutrition. The AF will be used to fund and scale up the following activities:

Under subcomponents 1.1 and 1.2: financial management and leadership training for cooperatives and FGs, and support to the formation and strengthening of FGs, PGs, and Water Users Associations (WUAs).

Under subcomponent 1.3: rollout of training for CRPs, nutrition awareness and sensitization activities, and support to the Food for Health Initiative of the MoAF (including support to audio-visual production, development of nutrient fact sheets, and production and value-addition related aspects of the PM's Healthy Drukyl Campaign).

All the AF activities for Component 1 described above exist in the current project and are considered as scale-up. The MoAF Food for Health Initiative is a new platform to better scale the existing nutrition promotion activities considered crucial to the COVID-19 response.

1.2 Component 2: Enhancing Farmer Productivity (Original Grant: \$5.209m, AF Grant: \$3.299m)

The existing subcomponents include: 2.1 water use efficiency, 2.2 improved farm management and technical and institutional capacity building, and 2.3 improved agricultural inputs and technologies. The AF will be used to fund and scale up the following activities:

Under subcomponent 2.1: Technologies to enhance water use efficiency will be promoted, including drip irrigation systems, rainwater harvest systems, and smart irrigation for urban farming. The PMU will monitor and mitigate any livelihood impacts related to land acquisition/requirements, if at all applicable, including for informal users of public land.

Under subcomponent 2.2: training on farm management, crop production, pest management, and record keeping; capacity building on advanced technical skills and knowledge on targeted commodities; demonstrations on crop production; integrated pest management.

Under subcomponent 2.3: farm inputs (i.e., improved seeds and seedlings, drum seeders and weeding tools), plastic mulching, mini-tillers, support to organic farming (i.e., biodigester), poly-houses for protected agriculture, and electric fencing.

All the AF activities for Component 2 described above exist in the current project and are considered as scale-up.

1.3 Component 3: Enhancing Access to Markets (Original Grant: \$1.001m, AF Grant: \$0.978m)

The existing subcomponents include: 3.1 post-harvest and market infrastructure support and 3.2 linkages to domestic and export markets. The AF will be used to fund and scale up the following activities:

Under subcomponent 3.1: multi-chamber and multi-commodity cold storages for the districts and to support the Integrated Fruit Processing Plant (NPH-SC in Dagapela, Dagana); post-harvest and market infrastructure (i.e. packhouses, storage facilities, vegetable curing shed, and roadside marketing facilities), and various equipment (i.e. dryers, sealing and packing materials and tools, weighing balance, plastic crates, and refrigerators and deep freezers). For cold storage, the project will consider climate-smart refrigeration technologies.

Under subcomponent 3.2: support the pilot in Chukha district for the development, training, and implementation of online marketing applications (web and mobile). The pilot will be used as an example for later roll-out to other districts.

All the AF activities for Component 3 described above exist in the current project and are considered as scale-up. Cold storages and the pilot of online marketing have not yet been implemented under the current project, but are considered crucial to the COVID-19 response and these fall under the goals of this Component, particularly under inputs and support to farmers to minimize postharvest losses, improve shelf life, enhance product quality, storage and packaging, and transportation, and under improving access to markets. The parent ESMF will be updated accordingly.

1.4 Component 4: Project Management (Original Grant: \$0.711m, AF Grant: 0.243m) The AF will be used to i) staff the PMU up to the extended closing date (including a procurement expert, an administrative assistant, and a marketing and value chain expert), ii) support the M&E by funding the annual outcomes survey, and iii) fund other operational costs including travel, vehicle maintenance, and PST and PSC meetings.

2. GENERAL DESCRIPTION OF TASK(S) AND OBJECTIVES TO BE ACHIEVED

The recently concluded mid-term review (MTR) (FAO, 2020) of FSAPP recommended hiring an Environment and Safeguard Specialist (ES) through TA-FSAPP. The project has much emphasis on environment and safeguard especially in the construction activities which involves bringing together different sectors. The main aim of ES is to focus both on technical aspects of environmental and coordination with World Bank, Project Management Unit (PMU) staff and Project Implementation Units (PIUs).

Under the overall supervision of the AFAOR, the technical supervision of the Lead Technical Officer (LTO) in FAORAP, and in close cooperation with concerned Government officials, the National Project Personal (NPP) on Safeguards/Gender Specialist is responsible for ensuring gender and social inclusiveness in the overall project process and implementation, and adherence to the environmental and safeguard policies as specified in the ESMF in relation to investment (non-TA) activities of FSAPP. The position was part time for two months spread over eight months. More specifically, the NPP will:

- Ensure, systematic collection, analysis, and use or sex disaggregated data including for monitoring and reporting purposes developed.
- Prepare ESMP for all the construction activities under the additional financing.
- Prepare Resettlement Plan supported and endorsed by the project.
- Conduct capacity development and awareness on gender equality and social inclusiveness for concerned Ministry of Agriculture and Forests officials, project stakeholders and beneficiaries carried out.
- Ensure ESMF is followed for all new constructions to address relevant social and environmental issues during the project implementation in compliance with the relevant Royal Government of Bhutan and World Bank policies.
- Drafted constitution and by-laws of WUA for Thareykhola and Laringkhola Irrigation schemes under initial project.
- Conduct impact assessment of all irrigation schemes in comparison to the baseline date of 2018 carried out.

2.1 FSAPP CONTEXT ON Environmental and Social Policies and Regulations

Bhutan has its national policy and legislation on environment and social protections. The Environment Assessment Act (EAA), 2000 and the Regulation for the Environmental Clearance of Projects and Regulation on Strategic Environmental Assessment, 2002, usually referred to as “EC Regulations” are the most relevant policy documents to refer for environmental and social impact assessment and development of the ESMF for FSAPP. The other national policies relevant to refer in FSAPP are the Water Act, 2011 and the Forest and Nature Conservation Act (FNCA), 1995. The EAA, 2000, EC Regulation, 2002 are accessible on the National Environment Commission (NEC) website: www.nec.gov.bt and the FNCA, 1995 is accessible on the Ministry of Agriculture and Forests (MoAF) website: www.moaf.gov.bt. The relevant laws and policies pertaining to FSAPP activities are provided in Table1.

Table 2: Bhutan's national laws, rules and regulations which can be applied to mitigate environmental issues and redress social concerns	
Issues	National Policy & legislation
Space occupation by infrastructure especially irrigation canals.	EAA, 2000, EC Regulation, 2002, and FNCA, 1995.
Resources use conflict especially water and land.	EAA, 2000, EC Regulation, 2002, Water Act 2011, FNCA, 1995.
Soil erosion/landslide.	EAA, 2000, EC Regulation, 2002
Extraction (excessive) of water and forest resources.	EAA, 2000, EC Regulation, 2002, Water Act, 2011 and FNCA, 1995.
Pollution (Land, Water & Air).	NEPA, EA Act, WA, and Waste Prevention and Management Act (WPMA).
Culture conflict between residents and project workers.	The Constitution, EAA, 2000, EC Regulation, 2002,
Disturbance to wildlife habitat, migration, breeding, and pollination.	EAA, 2000, EC Regulation, 2002, and FNCA, 1995.
Human and environmental health degradation from agrochemicals	EAA, 2000, EC Regulation, 2002
Pesticides uses	Pesticides Act of Bhutan, 2000.
Disputes amongst farmers' groups or individual conflicting with other members	Cooperative Act of Bhutan, 2009
Grievance redress mechanism	Anti-corruption of Bhutan, 2011
Labor related	Labour and Employment Act of Bhutan, 2007 Regulation on Occupational Health, Safety and Welfare, 2012 Occupational standard guidelines

The Bank's operational policy OP/BP 4.01: Environment Assessment applies to FSAPP in Bhutan. The other applicable policies for the FSAPP are the Forest, OP 4.36, Involuntary Resettlement, OP 4.12, and Pest Management, OP 4.09.

2.2 ENVIRONMENT AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

This assessment followed the procedures outlined in Revised Environment and Social Management Framework (ESMF) for additional funding by Project Management Unit for mainstreaming

environmental and social concerns in the project. The ESMF has been updated by the PMU in consultation with the World Bank's team and the PIUs to envisage the activities of the Additional Financing (AF). This assessment followed the principles for the overall social and environmental management of sub-projects: (i) activities with severe negative environmental and/or social impacts will not be supported, and (ii) all eligible subprojects will be screened to identify and assess the associated environmental and social impacts. Among others, the revised ESMF details out additional procedures in conducting activities in response to the COVID-19 pandemic including, but not limited to the World Health Organisation's COVID-19 Occupational Health and Safety Guidelines; World Bank's COVID-19 Considerations in Construction/civil works project and Addressing Sexual Exploitation and Abuse/Sexual Harassment.

The assessment followed the FSAPP procedures for environmental and social sustainability of sub-project interventions as outlined in FSAPP ESMP framework document.

2.3 IMPLEMENTATION ARRANGEMENTS, MONITORING AND EVALUATION

The project is being implemented by the Department of Agriculture, Ministry of Agriculture and Forests. An independent Project Management Unit (PMU) within the DoA, MoAF was established which is responsible for implementation and monitoring of the ESMF. The mandated ESIA/IESE and the EC also take into consideration all the social issues.

3. OBJECTIVE OF ESIA AND ESMP

The ESIA and the ESMP aim to:

- i. Assess the environmental and social impact of the FSAPP intervention by collection of data and analyze the same (Pack houses, cold storages and other infrastructure and farm management activities)
- ii. Plan mitigation measures for the impacts in the form of ESMP
- iii. Plan consultation with stakeholders for dissemination of information and stakeholder engagement.

4. ASSESSMENT METHODS FOR CENTRALIZED PACK HOUSES (CPH), COLD STORE(CS), FIELD PACKHOUSES (FPH)

As part of planned screening for development of ESMP of proposed Centralized Pack Houses (CPH), Cold Stores (CS), Field Pack House (FPH), the Safeguard/Gender specialist visited Haa Dzongkhag from 13-16 May 2021, and from 24-27 May 2021, visited Dagana dzongkhags, respectively and assessed these sites using ES screening and compliance tools (Annexures 7 in Revised Environment and Social Management Framework of FSAPP). Other dzongkhags were administered remotely due to COVID-19 pandemic restrictions on travel as other places; lower Chukha, lower Dagana, Samtse and Sarpang were declared as high-risk zone for the pandemic by RGOB. Table 2 shows proposed Pack-Houses, Field Pack Houses and Cold Storages at different sites within FSAPP covered area and

Table 2 : Proposed Centralized Cold Store, Pack House and Field Pack House at different sites within FSAPP covered area					
Ser	PIUs	Type of structure	Name and location of construction site	Capacity/dimension	Assessment method
1	Samtse Dzongkhag	Cold Store (CS) and centralized pack house (CPH)	Budhoney, Samtse Gewog (Location: RNR Technology Park)	180 MT (CS) 14.25 m x 7m x 2.7 m (CPH)	Remotely administered data collection by PIU officials
2	Samtse Dzongkhag	Field pack house	Sa-Nga-Chhoeling gewog (Depheling maed)	10.4 m x 5.4m x 2.7 m	-Do-
3	Samtse Dzongkhag	Field pack house	Yoeseltse gewog (Near Weekend marketing shed)	10.4 m x 5.4m x 2.7m	-Do-
4	Sarpang Dzongkhag	Field Pack House	Rateypani, Gakidling Gewog	10.4 M X 5.4M X 2.7M	-Do-
5	Haa Dzongkhag	Centralized Pack House	Sibjithang, Gakiling geog	14.25 m x 7 m x 2.7m	Site visited and assessed (Attached as Annex)
6	Haa Dzongkhag	Field Pack House	Sangbay Ama, Sangbaykha geog centre	10 m x 5.4 m x 2.7 m	-Do-
7	Haa Dzongkhag	Field Pack House	Eusu geog centre	-DO-	-Do-
8	Dagana Dzongkhag	Cold Store	Dagapela within NPHC Sub-Centre	100 MT	-Do-
9	Dagana Dzongkhag	Centralized Pack House	DO	14.25 m x 5.4 m x 2.7m	-DO-

4.1 ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT OF PACK HOUSE AND FIELD PACK HOUSE OF HAA DZONGKHAG

The detailed descriptions of all construction sites will remain same in all project Dzongkhags and is provided in overall assessment section; therefore, repetition is avoided in this report. Since all sites had met the eligibility criteria, the project sites are evaluated for environmental and social impacts. Each site is evaluated based on environmental and social impact forms from the project document and are shown on following Tables. Tables 3 to 5 provides details of centralized pack house and field pack houses under Haa Dzongkhag.

4.1.1 Centralized Pack House at Sibjithang

Table 3: ES Assessments - Centralized Pack House at Sibjithang			
	Environmental /Social Issues	Description of Mitigation Measures	1=good; 0= acceptable; -1 = bad
Pre-construction			
1	Land	State Reserve Forest (SRF) requiring Land User Certificate to be processed by Dzongkhag PIUs.	1
2	Loss or damages to trees and existing vegetation cover due to site clearance, machinery operation or disposal of excavated materials	There are no standing trees on the proposed site, it is covered with annuals and bushes, however the excavated materials should be disposed-off properly and should be used for filling some depressed areas nearby.	1
Construction phase			
3	Loss or damages to trees and existing vegetation cover due to site clearance, machinery operation or disposal of excavated materials	Stockpile topsoil separately from subsoil and should be used for landscape management around the packhouse after completion of construction of the infrastructure	1
4	Dust, smoke	Spray water spraying twice a day for controlling of dust and avoid burning during windy situations and cooking should be done on improve stoves.	1
5	Noise, vibration	Minimize the deployment of heavy machinery such as bulldozer during construction and avoid using noisy machineries during construction especially towards the night.	1
6	Disturb vegetation cover, cut trees and timber	No cutting of trees is foreseen on the construction site as the area is covered with grasses, forbs and bushy vegetations only and	1

	requirement for construction	to meet the timber requirement for construction felling of trees should be strictly following DoFPS regulations.	
7	Waste generation	Minimize waste generation advised to maintained adequate number of garbage bins and segregate waste into degradable and non-degradable and dispose them in designated areas identified by Dzongkhag Environmental Sector/NEC.	1
9	Water pollution	Avoid use of any chemicals e.g., paints/petroleum products near or in water tanks & running water tapes and on the river/streams. Any water from construction from construction sites should be treated before it joins the main streams/rivers. (Construct a ditch to collect all wastewater from the construction site)	1
10	Localised landslides, flooding	Overall area is prone to landslides as indicated in ES BTOR, therefore a careful mitigation plan should be developed by the Government and implemented for the entire area in future, it is beyond the scope of FSAPP. For the PH, the outlet water from the PH should be securely put in a soak pit or drained out from the PH in HDPE pipe or RCC drain. <i>A proper protective mitigation plan along Amochu and its tributary above Sibjithang should be implemented by the Government prior to major investment in the area.</i>	0
11	Traffic disturbance	Since the site is near the highway, all the materials for construction should be stored away from the road. Construction activities should not stop the vehicular movement. Avoid stockpiling any construction materials on the road.	1
12	Public health and safety	Maintain construction site & materials under enclosures. Follow COVID-19 safety protocols all times. (see details under COVID-19 SOP)	0
13	Damages or disrupt operations of existing infrastructure	Minimize plinth area excavation to avoid damages to adjacent residential homes/offices.	0

14	Disturb socio-economic activities	Awareness to workers and contractors prior to construction awards. The construction contract may also include the socio-cultural sensitivities.	1
15	Social impacts related to mobilisation of workers to the site	Educate migrant workers/national workers on national laws and make them aware on various aspects of laws governing social harmony (local govt and dzongkhag administration should be involved in awareness forums). Workers should also be made aware of GBV laws and to adhere by them and the proper GRM channels to give any related complaints.	1
16	Impacts on physical cultural objects	There are no adjacent physical cultural objects in the area that could possibly be impacted by the construction of PH.	1
17	Disturbance to farming land	There are no farmlands nearby so there will be no impact.	1
Post Construction (operation phase)			
18	Cause dust, noise during operation phase (e.g. from pumps)	There could be minimal no disturbance emanating from the PH.	1
19	Safety risks for community	There are no risks to community	1
20	Water pollution/	The could be some risks of water pollution from the PH, such polluted water should be treated/purified by letting the polluted water firstly to flow into a soak pit and then only release into natural system.	0
21	Waste generations	There will be waste from cleaning vegetables, these could be either given to farmers as animal feeds or can be make into compost.	0
22	Erosions during Rainy Seasons	The area falls under heavy precipitation during monsoon; therefore, all construction work should be carried out from fall to spring. The surrounding area of said infrastructure should be planted with lawn grasses and other ornamental plants after completion of the construction. The excavated and stockpiled from first excavation (3) should be used for restoring the surrounding for such purposes.	0

4.1.2 Field Pack House at Sangbay Ama

Table 4: ES Assessments - Field Pack House at Sangbay Ama			
	Environmental /Social Issues	Description of Mitigation Measures	1=good; 0= acceptable; -1 = bad
Pre-construction			
1	Land	SRF requiring Land User Certificate to be processed by Dzongkhag PIUs.	1
2	Loss or damages to trees and existing vegetation cover due to site clearance, machinery operation or disposal of excavated materials	There are no standing trees on the proposed site, it is covered with annuals and bushes, however the excavated materials should be disposed off properly and should be used for filling some depressed areas nearby.	1
Construction phase			
3	Loss or damages to trees and existing vegetation cover due to site clearance, machinery operation or disposal of excavated materials	Stockpile topsoil separately from subsoil and should be used for landscape management around the packhouse after construction.	1
4	Dust, smoke	Spray water spraying twice a day for controlling of dust and avoid burning during windy situations and cooking should be done on improve stoves.	1
5	Noise, vibration	Minimize the deployment of heavy machinery such as bulldozer during construction and avoid using noisy machineries during construction especially towards the night.	1
6	Disturb vegetation cover, cut trees	. No cutting of trees is foreseen on the construction site as the area is covered with grasses, forbs and bushy vegetations only and to meet the timber requirement for construction felling of trees should be strictly following DoFPS regulations.	1
7	Waste generation	Minimize waste generation Advised to maintained adequate number of garbage bins and segregate waste into degradable and non-	1

		degradable and dispose them in designated areas identified by Dzongkhag Environmental Sector/NEC.	
9	Water pollution	Avoid use of any chemicals e.g., paints near water tanks & running water tapes and on the river/streams.	1
10	Localised landslides, flooding	There could be localised flooding and movement of excavated materials to lower part. The excavated surface/soils should be covered or should be taken away from the site to refill depressed area. There is a need to construct retaining all on both sides (above and below the proposed site.	0
11	Traffic disturbance	Since the site is near the highway, all the materials for construction should be stored away from the road. Construction activities should not stop	1
12	Public health and safety	Maintain construction site & materials under enclosures. Follow COVID-19 safety protocols all times.	0
13	Damages or disrupt operations of existing infrastructure	Minimize plinth area excavation to avoid damages to adjacent residential homes/offices.	0
14	Disturb socio-economic activities	Awareness to workers and contractors prior to construction awards. The construction contract may also include the socio-cultural sensitivities.	1
15	Social impacts related to mobilisation of workers to the site	Educate migrant workers/national workers on national laws and make them aware on various aspects of laws governing social harmony (local govt and dzongkhag administration should be involved in awareness forums). Workers should also be made aware of GBV laws and to adhere by them and the proper GRM channels to give any related complaints.	1
16	Impacts on physical cultural objects	There are no adjacent physical cultural objects in the area that could possibly be impacted by the construction of PH	1
17	Disturbance to farming land	Although there are farmlands nearby the proposed site, the construction will not damage or occupy any farmlands.	1
Post Construction (operation phase)			

18	Cause dust, noise during operation phase (e.g. from pumps)	There could be minimal no disturbance emanating from the PH	1
19	Safety risks for community	There are no risk to community	1
20	Water pollution	There could be some risks, but the water should be treated after use in the PH and release to natural system or should be connected to nearby farmland for irrigation purpose.	0
21	Waste generations	There will be waste from cleaning vegetables, these could be either given to farmers as animal feeds or can be make into compost.	0
22	Erosions during Rainy Seasons	The area falls under heavy precipitation during monsoon; therefore, all construction work should be carried out from fall to spring. The surrounding area of said infrastructure should be planted with lawn grasses and other ornamental plants after completion of the construction. The excavated and stockpiled from first excavation (3) should be used for restoring the surrounding for such purposes.	0

4.1.3 Field Pack House at Eusu

Table 5: ES Assessment - Field Pack House at Eusu

	Environmental /social issues	Description of Mitigation Measures	1=good; 0= acceptable; -1 = bad
Pre-construction			
1	Land	SRF requiring Land User Certificate to be processed by Dzongkhag PIUs.	1
2	Loss or damages to trees and existing vegetation cover due to site clearance, machinery operation or disposal of excavated materials	There are no standing trees on the proposed site, it is covered with annuals and bushes, however the excavated materials should be disposed off properly and should be used for filling some depressed areas nearby.	1
Construction phase			
3	Loss or damages to trees and existing vegetation cover due to site clearance, machinery operation or disposal of excavated materials	Stockpile topsoil separately from subsoil and should be used for landscape management around the packhouse after construction.	1

4	Dust, smoke	Spray water spraying twice a day for controlling of dust and avoid burning during windy situations and cooking should be done on improve stoves.	1
5	Noise, vibration	Minimize the deployment of heavy machinery such as bulldozer during construction and avoid using noisy machineries during construction especially towards the night.	1
6	Disturb vegetation cover, cut trees	No cutting of trees is foreseen on the construction site as the area is covered with grasses, forbs and bushy vegetations only and to meet the timber requirement for construction felling of trees should be strictly following DoFPS regulations.	1
7	Waste generation	Minimize waste generation Advised to maintained adequate number of garbage bins and segregate waste into degradable and non-degradable and dispose them in designated areas identified by Dzongkhag Environmental Sector/NEC.	1
9	Water pollution	Avoid use of any chemicals e.g., paints near water tanks & running water tapes and on the river/streams.	1
10	Localised landslides, flooding	There could be localised flooding and movement of excavated materials to lower part. The excavated surface/soils should be covered or should be taken away from the site to refill depressed area. There is a need to construct retaining all on both sides (above and below the proposed site. Roof water should be securely grounded using piped	0
11	Traffic disturbance	Since the site is near the highway, all the materials for construction should be stored away from the road. Construction activities should not stope	1
12	Public health and safety	Maintain construction site & materials under enclosures. Follow COVID-19 safety protocols all times.	0

13	Damages or disrupt operations of existing infrastructure	Minimize plinth area excavation to avoid damages to adjacent residential homes/offices.	0
14	Disturb socio-economic activities	Awareness to workers and contractors prior to construction awards. The construction contract may also include the socio-cultural sensitivities.	1
15	Social impacts related to mobilisation of workers to the site	Educate migrant workers/national workers on national laws and make them aware on various aspects of laws governing social harmony (local govt and dzongkhag administration should be involved in awareness forums). Workers should also be made aware of GBV laws and to adhere by them and the proper GRM channels to give any related complaints.	1
16	Impacts on physical cultural objects	There are no adjacent physical cultural objects in the area that could possibly be impacted by the construction of PH	1
17	Disturbance to farming land	Although there are farmlands nearby the proposed site, the construction will not damage or occupy any farmlands.	1
Post Construction (operation phase)			
18	Cause dust, noise during operation phase (e.g. from pumps)	There could be minimal no disturbance emanating from the PH	1
19	Safety risks for community	There is no risk to community	1
20	Water pollution	There could be some risks, but the water should be treated after use in the PH and release to natural Haa chu.	0
21	Waste generations	There will be waste from cleaning vegetables, these could be either given to farmers as animal feeds or can be make into compost.	0
22	Erosion in rainy seasons	Since the area falls under cold region, it is advised to undertake construction work during warm period as curing RCC related work may be difficult in cold season. However like in other sites enough preventive measures should be in place to prevent soil erosions from the site. The surrounding area of said infrastructure should be planted with lawn grasses and other ornamental plants after completion of the construction. The excavated and stockpiled from first excavation(3) should be used for restoring the surrounding for such purposes.	0

4.2 ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT OF CENTRALIZED PACK HOUSE AND COLD STORE OF DAGANA DZONGKHAG

The proposed site for Centralized Pack House and Cold Storage facilities at Dagapela falls within the compound of National Post Harvest Sub Centre (NPH-SC) former Integrated Fruit Processing Plant (IFPP). The place is ideal as it lies next to FSO and very close to highway connecting to Dagana Dzongkhag to Lhamoizhingkha Dungkhag in the south. Since the proposed site for both the facilities lies within the same area a single impact assessment was conducted for possible environmental and social issues. The details of ES are provided in Table 6.

4.2.1 Centralized Pack House and Cold Store of Dagana Dzongkhag at Dagapela

Table 6: ES Assessment - Centralized Pack House and Cold Store at Dagapela			
	Environmental /Social Issues	Description of Mitigation Measures	1=good; 0= acceptable; -1 = bad
Pre-construction			
1	Land	SRF requiring Land User Certificate to be processed by Dzongkhag PIUs.	1
2	Loss or damages to trees and existing vegetation cover due to site clearance, machinery operation or disposal of excavated materials	There are no standing trees on the proposed site, it is covered with annuals and bushes, however the excavated materials should be disposed off properly and should be used for filling some depressed areas nearby.	1
2a	Erosion	Since the site fall on relatively on wetter part of Bhutan, working during the rainy season is not advisable for many reasons such as erosion, frequently roadblocks. The work should be awarded to contractors in fall and should be completed before rainy season begins next year. Infact all construction bids should follow this calendar.	1
Construction phase			
3	Loss or damages to trees and existing vegetation cover due to site clearance, machinery operation or disposal of excavated materials	Stockpile topsoil separately from subsoil and should be used for landscape management around the packhouse after construction.	1
4	Dust, smoke	Spray water spraying twice a day for controlling of dust and avoid burning during windy situations and cooking should be done on improve stoves.	1
5	Noise, vibration	Minimize the deployment of heavy machinery such as bulldozer during construction and avoid	1

		using noisy machineries during construction especially towards the night.	
6	Disturb vegetation cover, cut trees	No cutting of trees is foreseen on the construction site as the area is covered with grasses, forbs and bushy vegetations only and to meet the timber requirement for construction felling of trees should be strictly following DoFPS regulations.	1
7	Waste generation	Minimize waste generation Advised to maintained adequate number of garbage bins and segregate waste into degradable and non-degradable and dispose them in designated areas identified by Dzongkhag Environmental Sector/NEC.	1
9	Water pollution	Avoid use of any chemicals e.g., paints near water tanks & running water tapes and on the river/streams.	1
10	Localised landslides, flooding	There could be localised flooding and movement of excavated materials to lower part. The excavated surface/soils should be covered or should be taken away from the site to refill depressed area. There is a need to construct retaining all on both sides (above and below the proposed site.	0
11	Traffic disturbance	Since the site is near the highway, all the materials for construction should be stored away from the road. Construction activities should not stope	1
12	Public health and safety	Maintain construction site & materials under enclosures. Follow COVID-19 safety protocols all times.	0
13	Damages or disrupt operations of existing infrastructure	Minimize plinth area excavation to avoid damages to adjacent residential homes/offices.	0
14	Disturb socio-economic activities	Awareness to workers and contractors prior to construction awards. The construction contract may also include the socio-cultural sensitivities.	1

15	Social impacts related to mobilisation of workers to the site	Educate migrant workers/national workers on national laws and make them aware on various aspects of laws governing social harmony (local govt and dzongkhag administration should be involved in awareness forums). Workers should also be made aware of GBV laws and to adhere by them and the proper GRM channels to give any related complaints.	1
16	Impacts on physical cultural objects	There are no adjacent physical cultural objects in the area that could possibly be impacted by the construction of PH and cold store.	1
17	Disturbance to farming land	Although there are farmlands nearby the proposed site, the construction will not damage or occupy any farmlands. In fact these facilities are supposedly help farmers in many ways.	1
Post Construction (operation phase)			
18	Cause dust, noise during operation phase (e.g. from pumps)	There could be minimal to no disturbance emanating from the PH.	1
19	Safety risks for community	There are no risk to community.	1
20	Water pollution	There could be some risks of water pollution, but the water should be treated after use in the PH/cold store and release to natural system of streams or can be use in agricultural filed nearby.	0
21	Waste generations	There will be waste from cleaning vegetables, these could be either given to farmers as animal feeds or can be make into compost.	0
22	Erosion in rainy seasons	The area falls under moderate to heavy precipitation during monsoon; therefore, all construction work may be carried out During dry period. The surrounding area of said infrastructure should be planted with lawn grasses and other ornamental plants after completion of the construction. The excavated and stockpiled from first excavation (3) should be used for restoring the surrounding for such purposes.	0

4.3 ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT OF CENTRALIZED PACK HOUSE, COLD STORE, AND FIELD PACKHOUSES OF SAMTSE DZONGKHAG

Samtse Dzongkhag had proposed four infrastructures under the additional funding and the proposed sites for Field Pack House at Yoelseltse geog, Cold Store and Centralized Pack House at Buduney and Field Pack House at Depheling. The proposed facilities fall at different locations within the Dzongkhag

all the sites are ideal for the purposes as they lie within population centers and near to production of agricultural crops.

4.3.1 Field Pack House at Yoeseltse

Table 7: ES Assessment – Field Pack House at Yoeseltse			
	Environmental /Social Issues	Description of Mitigation Measures	1=good; 0= acceptable; -1 = bad
Pre-construction			
1	Land	SRF requiring Land User Certificate to be processed by Dzongkhag PIUs.	1
2	Loss or damages to trees and existing vegetation cover due to site clearance, machinery operation or disposal of excavated materials	There are no standing trees on the proposed site, it is covered with annuals and bushes, however the excavated materials should be disposed off properly and should be used for filling some depressed areas nearby. Stockpile topsoil separately from subsoil and should be used for landscape management around the packhouse after construction.	1
2a	Erosion	Since the site fall on relatively on wetter part of Bhutan, working during the rainy season is not advisable for many reasons such as erosion, frequently roadblocks. The work should be awarded to contractors in fall and should be completed before rainy season begins next year. In fact, all construction bids should follow this calendar.	1
Construction phase			
3	Loss or damages to trees and existing vegetation cover due to site clearance, machinery operation or disposal of excavated materials	Stockpile topsoil separately from subsoil and should be used for landscape management around the packhouse after construction.	
4	Dust, smoke	Spray water spraying twice a day for controlling of dust and avoid burning during windy situations and cooking should be done on improve stoves.	1
5	Noise, vibration	Minimize the deployment of heavy machinery such as bulldozer during construction and avoid using noisy machineries during construction especially towards the night.	1

6	Disturb vegetation cover, cut trees	No cutting of trees is foreseen on the construction site as the area is covered with grasses, forbs and bushy vegetations only and to meet the timber requirement for construction felling of trees should be strictly following DoFPS regulations.	1
7	Waste generation	Minimize waste generation Advised to maintained adequate number of garbage bins and segregate waste into degradable and non-degradable and dispose them in designated areas identified by Dzongkhag Environmental Sector/NEC.	1
9	Water pollution	Avoid use of any chemicals e.g., paints near water tanks & running water tapes and on the river/streams.	1
10	Localised landslides, flooding	There could be localised flooding and movement of excavated materials to lower part. The excavated surface/soils should be covered or should be taken away from the site to refill depressed area. There is a need to construct retaining all on both sides (above and below the proposed site.	0
11	Traffic disturbance	Since the site is near the highway, all the materials for construction should be stored away from the road. Construction activities should not stop	1
12	Public health and safety	Maintain construction site & materials under enclosures. Follow COVID-19 safety protocols all times.	0
13	Damages or disrupt operations of existing infrastructure	Minimize plinth area excavation to avoid damages to adjacent residential homes/offices.	0
14	Disturb socio-economic activities	Awareness to workers and contractors prior to construction awards. The construction contract may also include the socio-cultural sensitivities.	1
15	Social impacts related to mobilisation of workers to the site	Educate migrant workers/national workers on national laws and make them aware on various aspects of laws governing social harmony (local govt and dzongkhag administration should be	1

		involved in awareness forums). Workers should also be made aware of GBV laws and to adhere by them and the proper GRM channels to give any related complaints.	
16	Impacts on physical cultural objects	There are no adjacent physical cultural objects in the area that could possibly be impacted by the construction of PH and cold store.	1
17	Disturbance to farming land	Although there are farmlands nearby the proposed site, the construction will not damage or occupy any farmlands. In fact these facilities are supposedly help farmers in many ways.	1
Post Construction (operation phase)			
18	Cause dust, noise during operation phase (e.g. from pumps)	There could be minimal to no disturbance emanating from the PH.	1
19	Safety risks for community	There are no risk to community.	1
20	Water pollution	There could be some risks of water pollution, the water should be treated after use in the PH/cold store and release to natural system of streams or can be use in agricultural filed nearby.	0
21	Waste generations	There will be waste from cleaning vegetables, these could be either given to farmers as animal feeds or can be make into compost.	0
22	Erosion in rainy seasons	The area falls under heavy precipitation during monsoon; therefore, all construction work should be carried out from fall to spring. The area falls under heavy precipitation during monsoon; therefore, all construction work should be carried out from fall to spring. The surrounding area of said infrastructure should be planted with lawn grasses and other ornamental plants after completion of the construction. The excavated and stockpiled from first excavation (3) should be used for restoring the surrounding for such purposes.	0

4.3.2 Cold Store and Centralized Pack House at Buduney

The proposed cold store and centralized pack house under Samtse Dzongkhag at Buduney will be developed within the same site/compound, therefore single ES is foreseen sufficient for the site.

Table 8: ES Assessment - Cold Store and Centralized Pack House at Buduney			
	Environmental /social issues	Description of Mitigation Measures	1=good; 0= acceptable; -1 = bad
Pre-construction			
1	Land	SRF requiring Land User Certificate to be processed by Dzongkhag PIUs.	1
2	Loss or damages to trees and existing vegetation cover due to site clearance, machinery operation or disposal of excavated materials	There are no standing trees on the proposed site, it is covered with annuals and bushes, however the excavated materials should be disposed off properly and should be used for filling some depressed areas nearby.	1
2a	Erosion	Since the site fall on relatively on wetter part of Bhutan, working during the rainy season is not advisable for many reasons such as erosion, frequently roadblocks. The work should be awarded to contractors in fall and should be completed before rainy season begins next year. In fact all construction bids should follow this calendar.	1
Construction phase			
3	Loss or damages to trees and existing vegetation cover due to site clearance, machinery operation or disposal of excavated materials	Stockpile topsoil separately from subsoil and should be used for landscape management around the packhouse after construction.	1
4	Dust, smoke	Spray water spraying twice a day for controlling of dust and avoid burning during windy situations and cooking should be done on improve stoves.	1
5	Noise, vibration	Minimize the deployment of heavy machinery such as bulldozer during construction and avoid using noisy machineries during construction especially towards the night.	1
6	Disturb vegetation cover, cut trees	No cutting of trees is foreseen on the construction site as the area is covered with grasses, forbs and bushy vegetations only and to meet the timber requirement for construction felling of trees should be strictly following DoFPS regulations.	1

7	Waste generation	Minimize waste generation Advised to maintained adequate number of garbage bins and segregate waste into degradable and non-degradable and dispose them in designated areas identified by Dzongkhag Environmental Sector/NEC.	1
9	Water pollution	Avoid use of any chemicals e.g., paints near water tanks & running water tapes and on the river/streams.	1
10	Localised landslides, flooding	There could be localised flooding and movement of excavated materials to lower part. The excavated surface/soils should be covered or should be taken away from the site to refill depressed area. There is a need to construct retaining all on both sides (above and below the proposed site.	0
11	Traffic disturbance	Since the site is near the highway, all the materials for construction should be stored away from the road. Construction activities should not stope	1
12	Public health and safety	Maintain construction site & materials under enclosures. Follow COVID-19 safety protocols all times.	0
13	Damages or disrupt operations of existing infrastructure	Minimize plinth area excavation to avoid damages to adjacent residential homes/offices.	0
14	Disturb socio-economic activities	Awareness to workers and contractors prior to construction awards. The construction contract may also include the socio-cultural sensitivities.	1
15	Social impacts related to mobilisation of workers to the site	Educate migrant workers/national workers on national laws and make them aware on various aspects of laws governing social harmony (local govt and dzongkhag administration should be involved in awareness forums). Workers should also be made aware of GBV laws and to adhere by them and the proper GRM channels to give any related complaints.	1
16	Impacts on physical cultural objects	There are no adjacent physical cultural objects in the area that could possibly be impacted by the construction of PH and cold store.	1

17	Disturbance to farming land	Although there are farmlands nearby the proposed site, the construction will not damage or occupy any farmlands. In fact these facilities are supposedly help farmers in many ways.	1
Post Construction (operation phase)			
18	Cause dust, noise during operation phase (e.g. from pumps)	There could be minimal to no disturbance emanating from the PH.	1
19	Safety risks for community	There is no risk to community.	1
20	Water pollution	There could be some risks of water pollution, but the water should be treated after use in the PH/cold store and release to natural system of streams or can be use in agricultural filed nearby.	0
21	Waste generations	There will be waste from cleaning vegetables, these could be either given to farmers as animal feeds or can be make into compost.	0
22	Erosion in rainy seasons	The area falls under heavy precipitation during monsoon; therefore, all construction works may be carried out from fall to spring. The area falls under heavy precipitation during monsoon; therefore, all construction work should be carried out from fall to spring. The surrounding area of said infrastructure should be planted with lawn grasses and other ornamental plants after completion of the construction. The excavated and stockpiled from first excavation (3) should be used for restoring the surrounding for such purposes.	0

4.3.3 Field Pack House at Depheling

Table 9: ES Assessment – Field Pack House at Depheling			
	Environmental /social issues	Description of Mitigation Measures	1=good; 0= acceptable; -1 = bad
Pre-construction			
1	Land	SRF requiring Land User Certificate to be processed by Dzongkhag PIUs.	1
2	Loss or damages to trees and existing vegetation cover due to site clearance, machinery operation or	There are no standing trees on the proposed site, it is covered with annuals and bushes, however the excavated materials should be disposed off properly and should be used for filling some depressed areas nearby.	1

	disposal of excavated materials		
2a	Erosion	Since the site fall on relatively on wetter part of Bhutan, working during the rainy season is not advisable for many reasons such as erosion, frequently roadblocks. The work should be awarded to contractors in fall and should be completed before rainy season begins next year. Infact all construction bids should follow this calendar. However, if the construction happens during the monsoon season, soil erosion preventive measures should be in place such as providing plastic cover over exposed soils.	1
Construction phase			
3	Loss or damages to trees and existing vegetation cover due to site clearance, machinery operation or disposal of excavated materials	Stockpile topsoil separately from subsoil and should be used for landscape management around the packhouse after construction.	1
4	Dust, smoke	Spray water spraying twice a day for controlling of dust and avoid burning during windy situations and cooking should be done on improve stoves.	1
5	Noise, vibration	Minimize the deployment of heavy machinery such as bulldozer during construction and avoid using noisy machineries during construction especially towards the night.	1
6	Disturb vegetation cover, cut trees	No cutting of trees is foreseen on the construction site as the area is covered with grasses, forbs and bushy vegetations only and to meet the timber requirement for construction felling of trees should be strictly following DoFPS regulations.	1
7	Waste generation	Minimize waste generation Advised to maintained adequate number of garbage bins and segregate waste into degradable and non-degradable and dispose them in designated areas identified by Dzongkhag Environmental Sector/NEC.	1

9	Water pollution	Avoid use of any chemicals e.g., paints near water tanks & running water tapes and on the river/streams.	1
10	Localised landslides, flooding	There could be localised flooding and movement of excavated materials to lower part. The excavated surface/soils should be covered or should be taken away from the site to refill depressed area. There is a need to construct retaining all on both sides (above and below the proposed site).	0
11	Traffic disturbance	Since the site is near the highway, all the materials for construction should be stored away from the road. Construction activities should not stop the vehicular movement.	1
12	Public health and safety	Maintain construction site & materials under enclosures. Follow COVID-19 safety protocols all times.	0
13	Damages or disrupt operations of existing infrastructure	Minimize plinth area excavation to avoid damages to adjacent residential homes/offices.	0
14	Disturb socio-economic activities	Awareness to workers and contractors prior to construction awards. The construction contract may also include the socio-cultural sensitivities.	1
15	Social impacts related to mobilisation of workers to the site	Educate migrant workers/national workers on national laws and make them aware on various aspects of laws governing social harmony (local govt and dzongkhag administration should be involved in awareness forums). Workers should also be made aware of GBV laws and to adhere by them and the proper GRM channels to give any related complaints.	1
16	Impacts on physical cultural objects	There are no adjacent physical cultural objects in the area that could possibly be impacted by the construction of PH and cold store.	1
17	Disturbance to farming land	Although there are farmlands nearby the proposed site, the construction will not damage or occupy any farmlands. In fact these facilities are supposedly help farmers in many ways.	1
Post Construction (operation phase)			
18	Cause dust, noise during operation phase (e.g. from pumps)	There could be minimal to no disturbance emanating from the PH.	1
19	Safety risks for community	There are no risk to community.	1

20	Water pollution	There could be some risks of water pollution, but the water should be treated after use in the PH/cold store and release to natural system of streams or can be use in agricultural filed nearby.	0
21	Waste generations	There will be waste from cleaning vegetables, these could be either given to farmers as animal feeds or can be make into compost.	0
22	Erosion in rainy seasons	The area falls under heavy precipitation during monsoon; therefore, all construction work should be carried out from fall to spring. The area falls under heavy precipitation during monsoon; therefore, all construction work should be carried out from fall to spring. The surrounding area of said infrastructure should be planted with lawn grasses and other ornamental plants after completion of the construction. The excavated and stockpiled from first excavation (3) should be used for restoring the surrounding for such purposes.	0

4.4 ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT OF FIELD PACKHOUSE OF SARPANG DZONKHAG AT RATEYPANI

Sarpang Dzongkhag had proposed one Field Pack House at Rateypani under Gakiling geog under the additional funding component. The site is currently not easily accessible for visit as it falls under high COVID risk zone. Therefore, all data were collected by PIU officials and presented in the Table below.

4.4.1 Field Pack House at Rateypani

Table 10: ES Assessment – Field Pack House at Rateypani			
	Environmental /social issues	Description of Mitigation Measures	1=good; 0= acceptable; -1 = bad
Pre-construction			
1	Land	SRF requiring Land User Certificate to be processed by Dzongkhag PIUs.	1
2	Loss or damages to trees and existing vegetation cover due to site clearance, machinery operation or disposal of excavated materials	There are no standing trees on the proposed site, it is covered with annuals and bushes, however the excavated materials should be disposed off properly and should be used for filling some depressed areas nearby.	1
2a	Erosion	Since the site fall on relatively on wetter part of Bhutan, working during the rainy season is not advisable for many reasons such as erosion, frequently roadblocks. The work should be awarded to contractors in fall and should be completed before rainy season begins next year. In fact all construction bids should follow this calendar	0
Construction phase			
3	Loss or damages to trees and existing vegetation cover due to site clearance, machinery operation or disposal of excavated materials	Stockpile topsoil separately from subsoil and should be used for landscape management around the packhouse after construction.	1
4	Dust, smoke	Spray water spraying twice a day for controlling of dust and avoid burning during windy situations and cooking should be done on improve stoves.	1
5	Noise, vibration	. Minimize the deployment of heavy machinery such as bulldozer during construction and avoid using noisy machineries during construction especially towards the night.	1
6	Disturb vegetation cover, cut trees	No cutting of trees is foreseen on the construction site as the area is covered with grasses, forbs and bushy vegetations only and to meet the timber requirement for construction	1

		<p>felling of trees should be strictly following DoFPS regulations.</p>	
7	Waste generation	<p>Minimize waste generation Advised to maintained adequate number of garbage bins and segregate waste into degradable and non-degradable and dispose them in designated areas identified by Dzongkhag Environmental Sector/NEC.</p>	1
9	Water pollution	<p>Avoid use of any chemicals e.g., paints near water tanks & running water tapes and on the river/streams.</p>	1
10	Localised landslides, flooding	<p>There could be localised flooding and movement of excavated materials to lower part. The excavated surface/soils should be covered or should be taken away from the site to refill depressed area. There is a need to construct retaining all on both sides (above and below the proposed site.</p>	0
11	Traffic disturbance	<p>Since the site is near the highway, all the materials for construction should be stored away from the road. Construction activities should not stop</p>	1
12	Public health and safety	<p>Maintain construction site & materials under enclosures. Follow COVID-19 safety protocols all times..</p>	0
13	Damages or disrupt operations of existing infrastructure	<p>Minimize plinth area excavation to avoid damages to adjacent residential homes/offices.</p>	0
14	Disturb socio-economic activities	<p>Awareness to workers and contractors prior to construction awards. The construction contract may also include the socio-cultural sensitivities.</p>	1
15	Social impacts related to mobilisation of workers to the site	<p>Educate migrant workers/national workers on national laws and make them aware on various aspects of laws governing social harmony (local govt and dzongkhag administration should be involved in awareness forums). Workers should also be made aware of GBV laws and to adhere by them and the proper GRM channels to give any related complaints.</p>	1

16	Impacts on physical cultural objects	There are no adjacent physical cultural objects in the area that could possibly be impacted by the construction of PH and cold store.	1
17	Disturbance to farming land	Although there are farmlands nearby the proposed site, the construction will not damage or occupy any farmlands. In fact these facilities are supposedly help farmers in many ways.	1
Post Construction (operation phase)			
18	Cause dust, noise during operation phase (e.g. from pumps)	There could be minimal to no disturbance emanating from the PH.	1
19	Safety risks for community	There is no risk to community.	1
20	Water pollution	There could be some risks of water pollution but the water should be treated after use in the PH/cold store and release to natural system of streams or can be use in agricultural filed nearby.	0
21	Waste generations	There will be waste from cleaning vegetables, these could be either given to farmers as animal feeds or can be make into compost.	0
22	Erosion in rainy seasons	The area falls under heavy precipitation during monsoon; therefore, all construction work should be carried out from fall to spring. The area falls under heavy precipitation during monsoon; therefore, all construction work should be carried out from fall to spring. The surrounding area of said infrastructure should be planted with lawn grasses and other ornamental plants after completion of the construction. The excavated and stockpiled from first excavation (3) should be used for restoring the surrounding for such purposes.	0

4.5 ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT OF MARKET SHED OF CHUKHA DZONGKHAG AT RAMITEY

Chukha Dzongkhag had proposed one centralized pack house at Sampheling geog and Roadside Market Shed at Ramitey under the additional funding component of GAFSP (see Table 1). The site is currently not easily accessible for visit as it falls under high COVID risk zone. The construction of both the structures are differed as the area had been under prolonged COVID restrictions and often in lockdown situation. Therefore, the assessment for ESMP is not included in this report.

5. OVERALL ASSESSMENT

As mentioned earlier a brief descriptions and prescriptions for environmental and social compliance parameters for all infrastructure proposed under FSAPP are provided below.

5.1 Land Issues

The land acquisition requirement under AF is no different than the initial project. It is perceived that the public land will be used, and no private land will be acquired for the AF activities.

However, in some unavoidable circumstance, a voluntary land contribution for rural community infrastructure, such as farm roads and irrigation canals, is a common and long-established practice in Bhutan and there is no provision for any sort of compensation or land substitute as these are done purely on voluntarily-basis. World Bank-financed projects, completed and ongoing, have followed the same practice. Implementation experiences so far indicated that this practice is generally accepted and practiced smoothly. It is expected that FSAPP, under Additional Financing, with its focus and support to community infrastructures, will continue to follow the same practice for its land needs.

All the construction sites chosen for development of Centralized Pack Houses, Field Pack Houses and Cold Stores are proposed on the public land, administrative jurisdiction of the respective Dzongkhag Administrations/central agencies. Dzongkhags or central agencies can accord consent and approval with relevant documents without hassle. No resettlement of people or disruptions on their properties are foreseen in those sites. Since no additional protocol will be required regarding land except for getting national environmental clearance, it will be fairly an easy task for all sites as already cited in ES for each site.

5.2 Soil Erosion/Landslide

Soil erosion/landslides in Bhutan Himalayas are common, natural, and are frequents. Soil erosion often resulted from manmade interventions, especially irrigation channels, road constructions and other infrastructure development that are very prone to soil erosions. Whether the soil erosions are instigated by the monsoon, loose hill slopes, and other interventions, could affect the infrastructure. Therefore, ESIA/EIA should consider broad coverage of area stability study for infrastructure development such as retaining wall, proper drainage, and other mitigation measures such as tree plantations after the completion of the construction works are suggested.

5.3 Dust and Smoke

Currently, minimum and/or no dust and smoke will be emitted except when high winds blow through the construction areas. To prevent dust pollution, to both workers and commuters, the Specialist proposed that the contractors be made to spray water twice a day on the construction sites as well as on connecting roadside, once in the morning and evening. Burning of trashes or other materials should be avoided. There could be some dust emanating from movement of excavated soils from the construction sites, the soils should be carried to safe sites (landfills) identified by dzongkhag environmental officer/national environment commission and deposited with care. Any topsoil coming from excavation of construction site should be stockpiled for future use such as site development of surrounding areas after the completion of construction.

5.4 Noise and Vibration

There will be some noise generation from deployment of the construction machineries such as concrete mixer machine, wood planers, metal fabrication that includes welding, cutting, riding, deburring, polishing etc. These machines will produce some noises, it is advisable to use them during day hours and should not be used at night. Since the sites chosen to construct the infrastructure are relatively on flat terrains, the deployment of heavy earth moving equipment which cause serious vibration is not foreseen.

5.5 Public Health and Safety

The Regulation on Occupational Health, Safety and Welfare 2012 of Bhutan governs all aspects of workplace regulations, emanating from the rules and regulations, a brief outline is provided for FSAPP activities. Prior to start of construction activities the contractor at each FSAPP construction sites shall

- 1) prepare and implement an occupational health and safety program that ensures workplace of the construction is safe and healthy.
- 2) Prepare and implement the policy in consultation with the health and safety representative at each workplace
- 3) provide the information, instruction, and supervision necessary to ensure the health and safety of those workers in carrying out their work and to ensure the health and safety of other persons at the workplace.

4) With regard to COVID-19 pandemic will remain for foreseeable future, therefor all precaution as outlined in many health policies must be strictly adhered including frequent testing of workers and officials working within the FSAPP project and all project personnels required to follow the World Health Organisation's COVID-19 Occupational Health and Safety Guidelines; World Bank's COVID-19 considerations in construction/civil works project. A simplified version of COVID 19 is provided below.

5.5.1 COVID-19 SOP

Over a course of more than year COVID-19 pandemic Bhutan has developed several SOPs to contained the spread of the disease within its territory the details of all the SOPs and guidelines can be obtained from <http://www.moh.gov.bt/covid-19-clinical-management/> and <https://www.cabinet.gov.bt/wp-content/uploads/2020/03/National-Preparedness-and-Response-Plan-3rd-ed-1-1.pdf>. For the FSAPP activities the following guidelines are to be followed strictly. Employers/contractors should have a COVID-19 response plan to protect workers and thoroughly implement the national guidelines by involving health officer/worker in awareness and safety precautions.

Preventive measures decisions on closing or re-opening of workplaces and suspension or downscaling of work activities should be made considering the risk assessment, the capacity to implement preventive measures, and recommendations of national authorities for adjusting public health and social measures in the context of COVID-19. Following measures shall be promoted in the workplaces of FSAPP implementation by contractors and implementing agencies. All workers should be briefed on the following aspects prior to or during the execution of the works in all FSAPP sites.

5.5.1.1 Hand Hygiene

- Regular and thorough handwashing with soap and water or hand hygiene with alcohol-based hand-rub before starting work, before eating, frequently during the work shift, especially after

contact with co-workers or customers, after going to the bathroom, after contact with secretions, excretions, and body fluids, after contact with potentially contaminated objects (gloves, clothing, masks, used tissues, waste), and immediately after removing gloves and other protective equipment but before touching eyes, nose, or mouth.

- Hand hygiene stations, such as hand washing and hand rub dispensers, should be put in prominent places around the workplace and be made accessible to all staff, contractors, clients or customers, and visitors along with communication materials to promote hand hygiene.

5.5.1.2 Respiratory Hygiene

- Promote respiratory etiquette by all people at the workplace. Ensure that medical face masks and paper tissues are available at the workplace, for those who develop a runny nose or cough at work, along with bins with lids for hygienic disposal.
- Develop a policy on wearing a mask or a face covering in line with national or local guidance. Masks may carry some risks if not used properly.
- If a worker is sick, he/she should not come to work. If a member of staff or a worker feels unwell while at work, provide a medical mask so that they may get home safely.
- Where masks are used, whether in line with government policy or by personal choice, it is very important to ensure safe and proper use, care, and disposal.
- Defer or suspend workplace events that involve close and prolonged contact among participants, including social gatherings.
- Reduce and manage work-related travels, cancel or postpone non-essential travel to areas with community transmission of COVID-19, advise workers to comply with instructions from local authorities where they are traveling, as well as information on whom to contact if they feel ill while traveling.
- Workers returning from an area where COVID-19 transmission is occurring should monitor themselves for symptoms for 21 days and take their temperature twice a day; if they are feeling unwell, they should stay at home, self-isolate, and contact a medical professional.

5.5.1.2 Environmental Cleaning and Disinfection

- Promote cleaning, using soap or a neutral detergent, water, and mechanical action (brushing, scrubbing) removes dirt, debris, and other materials from surfaces. After the cleaning process is completed, disinfection is used to inactivate (i.e. kill) pathogens and other microorganisms on surfaces on working spaces.
- The selection of disinfectants should align with the local authorities' requirements for market approval, including any regulations applicable to specific sectors.
- High-touch surfaces should be identified for priority disinfection (commonly used areas, door and window handle, light switches, kitchen and food preparation areas, bathroom surfaces, toilets and taps, touchscreen personal devices, personal computer keyboards, and work surfaces).
- Disinfectant solutions must always be prepared and used according to the manufacturer's instructions, including instructions to protect the safety and health of disinfection workers, use of personal protective equipment, and avoiding mixing different chemical disinfectants.

- In indoor workplaces, routine application of disinfectants to environmental surfaces via spraying or fogging is generally not recommended because it is ineffective at removing contaminants outside of direct spray zones and can cause eye, respiratory, and skin irritation and other toxic effects.
- In outdoor workplaces, there is currently insufficient evidence to support recommendations for large-scale spraying or fumigation.
- Spraying of people with disinfectants (such as in a tunnel, cabinet, or chamber) is not recommended under any circumstances.

5.5.1.4 Risk Communication, Training, and Education

- Provide posters, videos, and electronic message boards to increase awareness of COVID-19 among workers and promote safe individual practices at the workplace, engage workers in providing feedback on the preventive measures and their effectiveness.
- Provide regular information about the risk of COVID-19 using official sources, such as government agencies and WHO, and emphasize the effectiveness of adopting protective measures and counteracting rumours and misinformation.
- Special attention should be given to reaching out to and engaging vulnerable and marginalized groups of workers, such as those in the informal economy and migrant workers, domestic workers, subcontracted and self-employed workers, and those working under digital labor platforms. Management of people with COVID-19 or their contacts.
- Workers who are unwell or who develop symptoms consistent with COVID-19 should be urged to stay at home, self-isolate, and contact a medical professional or the local COVID-19 information line for advice on testing and referral.
- Where local community transmission is high, and work continues, allow for a telemedicine consultation where available, or consider waiving the requirement for a medical note for workers who are sick so that they may stay home.
- All workers should be urged to self-monitor their health, possibly with the use of questionnaires, and take their body temperature regularly.
- Thermal screening at the workplace should be considered only in the context of a combination of measures for prevention and control of COVID-19 at the workplace and along with risk communication.
- Standard operating procedures should be prepared to manage a person who becomes sick at the workplace and is suspected of having COVID-19, including placing the person in an isolation room, limiting the number of people in contact, using personal protective equipment, and performing follow-up cleaning and disinfection.
- It is important to contact the local health authorities and to keep attendance and meeting records to facilitate or undertake contact-tracing.
- People who were in close contact at the workplace with persons with laboratory-confirmed COVID-19 should be quarantined for 14 days from the last time of the contact by WHO recommendations.²⁰ Specific measures for workplaces and jobs at medium risk.

In addition to the measures above, in case if FSAPP workplace falls under high-risk work activities and jobs, the following measures should be implemented:

- Assess the possibility of suspending the activity;

- Adherence to hygiene before and after contact with any known or suspected case of COVID-19.;
- Training of workers in infection prevention and control practices and use of personal protective equipment;
- Avoid assigning tasks with high risk to workers who have pre-existing medical conditions, are pregnant, or older than 60 years of age. Rights, duties, and responsibilities of workers and employers, workers, and their organizations should collaborate with health authorities in the prevention and control of COVID-19.
- The employers, in consultation with workers and their representatives, should take preventive and protective measures, such as engineering and administrative controls and provision of personal protective equipment and clothing for occupational safety and health and infection prevention and control. Such measures at the workplace must not involve any expenditure on the part of workers.
- Workers shall follow established occupational safety and health and infection prevention and control procedures, avoid exposing others to health and safety risks, participate in related training provided by the employer and report immediately to their supervisor any situation which they have reasonable justification to believe presents an imminent and danger to their life or health.
- Co-operation between management and workers and their representatives must be an essential element of workplace-related prevention measures (such as through workers' safety delegates, safety and health committees, and collaboration with providing information and training) and respecting the right and duties of workers and employers in occupational safety and health. COVID-19 and other diseases, if contracted through occupational exposure, could be considered occupational diseases.
- Plan of action Workplaces should develop action plans for prevention and mitigation of COVID-19 as part of the business continuity plan and according to the results of the risks assessment and the epidemiological situation. The plan should also include measures for protecting health, safety, and security in re-opening, closing and modifying workplaces and work arrangements.
- Re-opening of workplaces should be carefully planned and all possible risks for health and safety should be properly assessed and controlled.
- The action plan and preventive measures put in place should be monitored and updated in case of changes in local epidemiological trends, new cases of COVID-19 at the workplace, or lack of compliance by workers, visitors, and clients or customers.
- Actions on prevention and mitigation of COVID-19 should be implemented together with actions for addressing other occupational safety and health risks such as ergonomic problems, heavy workloads and long working hours, remote working, psychosocial risks, poisonings, among others. Occupational health services should strengthen their capacity to carry out a risk assessment, infection prevention and control, and medical surveillance and organize mental health and psychosocial support in the context of COVID-19.
- In developing and implementing action plans for prevention and mitigation of COVID-19 workers and their representatives should be properly consulted and all workers should be informed about the measures introduced, using specific risk communication and

community engagement approaches. Local authorities and local public health authorities can provide up to date information and facts, support community engagement activities, and offer specific recommendations on the prevention of COVID-19 among the workers

- There must be no discrimination in the access of workers to protective measures for the prevention of COVID-19. Special efforts should be taken to prevent the social stigma of workers suspected of being infected, infected with, or recovered from COVID-19.

5.5.1.5 Public Meetings under COVID-19 situations

With the outbreak and spread of COVID-19, people are mandated by the national law, to follow social distancing, and specifically to avoid public gatherings to prevent and reduce the risk of the virus transmission. Countries have taken various restrictive measures, some imposing strict restrictions on public gatherings, meetings, and people's movement, and others advising against public group events.

Considering the importance of confirming compliance with national law requirements, below are actions to be taken for FSAPP implementation:

- Identify and review planned activities under the project requiring stakeholder engagement and public consultations.
- Assess the level of proposed direct engagement with stakeholders, including location and size of proposed gatherings, frequency of engagement, categories of stakeholders (international, national, local), etc.
- Assess the level of risks of the virus transmission for these engagements, and how restrictions that are in effect in the country/project area would affect these engagements.
- Identify project activities for which consultation/engagement is critical and cannot be postponed without having a significant impact on project timelines. For example, selection of resettlement options by affected people during project implementation. Reflecting on the specific activity, consider viable means of achieving the necessary input from stakeholders (see further below);
- Assess the level of ICT penetration among key stakeholder groups, to identify the type of communication channels that can be effectively used in the project context.
- Avoid public gatherings (considering national restrictions), including public hearings, workshops, and community meetings.
- If smaller meetings are permitted, conduct consultations in small-group sessions, such as focus group meetings. If not permitted, make all reasonable efforts to conduct meetings through online channels, including Webex, Zoom, Google Meet, Microsoft Teams Meeting and Skype.
- Diversify means of communication and rely more on social media and online channels. Where possible and appropriate, create dedicated online platforms and chat groups appropriate for the purpose, based on the type and category of stakeholders.
- Employ traditional channels of communications (TV, newspaper, radio, dedicated phone-lines, and mail) when stakeholders do not have access to online channels or do not use them frequently. Traditional channels can also be highly effective in conveying relevant information to stakeholders and allow them to provide their feedback and suggestions.
- Where direct engagement with project-affected people or beneficiaries is necessary, such as would be the case for Resettlement Action Plans or Indigenous Peoples Plans preparation and implementation, identify channels for direct communication with each affected individual.

- In situations where online interaction is challenging, information can be disseminated through a digital platform (where available) like Facebook, Twitter, WeChat groups, WhatsApp groups, Project weblinks/ websites, and traditional means of communications (TV, newspaper, radio, phone calls, and mails with a clear description of mechanisms for providing feedback via mail and/or dedicated telephone lines. All channels of communication need to specify how stakeholders can provide their feedback and suggestions.

5.5.1.6 Maintain Healthy Business Operations Under COVID-19 pandemic condition

- All construction sites under the FSAPP should designate a safety and health officer to be responsible for responding to COVID-19 concerns. Workers should know who this person is and how to contact him/her.
- If an employee/worker is confirmed to have COVID-19 infection, contractor should inform health and safety officer and accordingly tackle the case as per the national guidelines (see appropriate guidelines on <http://www.moh.gov.bt/covid-19-clinical-management/>).
- Reach out to local public health officials to establish ongoing communications to facilitate access to relevant information before and during a local outbreak.
- All foreigner workers should follow “protocol for entry of foreign workers and other foreigners into Bhutan”. Details are provided in https://sep.nlcs.gov.bt/public/sop/08102020_3uv1430m0.pdf

5.5.2 Public Safety

There is low health and safety risks to construction workers, commuters, and residents from these constructions. To prevent any mishap, the contractor should provide safety gears to the workers such as hand gloves, rain boots, helmet, and thick workers’ attires in compliance with the Ministry of Works and Human Settlement/Ministry of, Labour and Human Resources safety rules and occupational standard guidelines. The contractor and site engineer should pay extra precaution to prevent mishap to children if the schools and playgrounds are located adjacent to the construction sites.

The local authorities should appraise the contractor and site engineers about the social risks from the workers such as molestation/sexual abuses and other crimes. The contractors and local law enforcement agencies should educate and make them aware of local laws, norms, and traditions prior to starting of the constructions and should be monitored regularly for compliance and strict adherence to national laws.

The contractor and site engineer should be advised to prevent any accidents from the storing, transportation, and use of construction materials. In this regard, they should be advised to store construction materials inside fence/enclosed spaces. The contractor and site engineer should also be advised to avoid traffic congestion resulting from transportation of construction materials.

5.6 Waste generation

No significant amount of waste generation from construction materials, wood sawing, and plastic use is expected in all construction sites. It is advised to avoid generation of metal wastes, plastic, and chemical wastes (paints). Nevertheless, the contractor and site engineer should be advised to minimize generation of construction wastes and clean the construction area once completed. Wood waste generation can be minimized as doors, windows and other wood works will be contracted out to sawmilling agencies. Plastic wastes should be minimized. The use of plastic and other non-biodegradable wastes after the construction period should be kept at minimum with segregation of degradable and non-degradable wastes and their proper disposal. The migrant workers should be housed in camps with sanitation facilities. The expert did not observed risks of drinking water pollution. However, the pollutants such as synthetic paints, petroleum products, plastics and other hazardous materials should not be thrown in streams/rivers or near drinking water sources. The said activities will be monitored frequently by Dzongkhag Environment Officer.

5.7 Addressing Sexual Exploitation and Abuse and Sexual Harassment in Civil Works.

Most of the laborers hired for rehabilitation are expected to be local, potentially reducing labor influx-related SEA risks, therefore, bidding documents should include specific requirements to minimize the use of expatriate workers and encourage local hiring. Mitigate SEA/SH risks stemming from construction activities are as follows:

- Put in place the multi-sectoral coordination and monitoring mechanism; and community awareness-raising activities to implement the SEA/SH mitigation measures effectively.
- Sign contractual obligations to prevent SEA/SH risks, by the signing of Codes of Conduct (CoC) and disciplinary actions for offenders.
- Put response mechanisms through survivor-centered mitigation measures and GMs to effectively handle SEA/SH complaints.
- Brief prospective contractors on Environmental, Social, and Occupational Health and Safety Standards and SEA-related requirements during pre-bid meetings.
- Incorporate requirements in the bidding documents for contractors to develop a GBV Action Plan, including an Accountability and Response Framework.
- Incorporate requirements in bidding documents to minimize the use of expatriate workers. Contractors and consulting firms submit Code of Conduct (CoC) with their bids.
- Based on the project's needs, the World Bank's Standard Procurement Documents and the implementing agency's policies and goals, defining the requirements to be included in the bidding documents for CoC that address GBV; and establishing how adequate GBV costs will be paid for in the contract, as well as worker training on SEA, HIV/AIDS mitigation, and CoC obligations.

5.8 Grievance Redress Mechanism

The GRM for the project will be based on Bhutan's existing dispute resolution mechanisms, both formal and informal, that rely on mediation and public hearing managed by local authorities. It is advised a Grievance Redress Committee to be established within the PMU comprising representatives from the MoAF and other stakeholders to receive complaints unresolved through the traditional mechanism. The grievances could also be redressed through the World Bank's Grievance Redress

System and the Inspection Panel. The following GRM could be adopted and adhered to effectively implement the GRM for the project areas, which are well reflected in the project document.

- DoA/PMU's representative, Gewog Engineer/Agriculture Extension Officer will be responsible for day-to-day supervision of contractor's environmental compliance. The PMU and the Bank will monitor periodically. When there are complaints, the DoA/PMU site supervisor together with the representative of the contractors will investigate the issues and agree on the corrective actions if necessary. The team will then follow up and document the corrective actions until the cases are completely resolved.
- The PMU and the Bank will monitor periodically the GRM implementation. When there are complaints regarding resettlement, the DoA/PMU site supervisor as well as the field level staffs assigned for the resettlement issue in each Dzongkhag will investigate the issues and agree on the corrective actions, if necessary. The team will then follow up and document the corrective actions until the cases are completely resolved.
- The Project Social Development Specialist will certify the agreed redressal measures carried out.
- The local community will be encouraged to participate in monitoring of GRM. Communities can make complaints to the assigned staff at each Dzongkhags, local authority, or PMU representative or via telephone directly to the PMU. The PMU will coordinate with relevant parties to address the complaints.
- Dzongkhag Environment Officer/any person assigned by National Environment Commission will certify the environmental mitigation measures carried out by the Contractors in the monthly payment requests. The PMU/DoA makes the payment and can apply bonuses/fines as per the compliance framework. The local community led by the Chiog Tshogpa will be encouraged to participate in daily monitoring of contractor's environmental compliance. Communities can make complaints to the contractor's site Engineer, local authority, or PMU representative or via telephone directly to the PMU. The PMU will coordinate with relevant parties to address the complaints recommendation/follow-up.

5.10 Resettlement Plan

This Resettlement Framework (RF) covers implementation modalities for the Bhutan Additional Financing to the Food Security and Agriculture Productivity Project (FSAPP) with the aim of assisting the preparation of Abbreviated Resettlement Action Plan (A-RAP) as and when needed. The Project Development Objective (PDO) was to increase agricultural productivity and enhance access to markets for farmers in selected gewogs in Southwest Bhutan.

The proposed sites for PHs and CSs falls under public land and none of them fall in private therefore land acquisition and involuntary resettlement, is not foreseen within the scope of these infrastructure development. In case, there would be requirement for acquisition of private land, the resettlement activities will be guided by Bhutan Land Act of 2007, Land Acquisition and Compensation Rules and

Regulations 2021 and the World Bank's OP 4.12 Involuntary Resettlement. Both the policies guide on the entitlement of titled and non-titled holders, and the scope of compensation are clearly spelt out in the law and the regulations.

Considering all the facts mentioned above, the need to produce A-RAP for the planned infrastructure is not foreseen and will not be elaborated further. However, if need arises such as to relocate the squatters because of the infrastructure development, the titleholders will be compensated commensurate to their entitlements as per impact created by the project. To this a guideline for budget preparation has been provided in the RF. The PMU will be responsible for implementation of the A-RAP. Various duties and responsibilities of Social Development Specialist, staff at each Dzongkhags have been identified by PMU as well.

5.11 Standard Operation Procedure (SOP) for all Infrastructure

After the completion of PHs, cold storages construction, they should be managed sustainably and the concerned PIUs should develop clear SOPs for their sustainable management and daily operations. It is suggested that the SOPs should consider inclusion of youths and women in decision making processes. Moreover, the SOPS should be developed involving all stakeholders following proper participation processes. Each member should be equally aware of his/her role and responsibilities in managing the infrastructure. Without ensuring the proper management and operations of PHs and cold storages, it may not serve the intended purpose. Therefore, certain aspects such as fund management and routine maintenance of the facilities are integral part of long-term sustainability of the infrastructure. The compliance monitoring should be done regularly, as indicated in summary of compliance for each project activities and any observed deviant should be discussed in stakeholder meetings.

SUMMARIZED ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Table 11: Summarized version of environmental and Social Plan (ESMP) for FSAPP for selected civil and technologies under additional financing .					
SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
HAA DZONGKHAG					
Centralized Pack Houses at Sibjithang,(S) Field Pack Houses at Sangbay Ama (SA) and EUSU (U).	Land acquisition may take away private properties	Land public Clearance	Free, prior and informed consent/agreement	Once prior to construction	DAO & Engineer, Haa Dz; contractor Dzongkhag Environmental Officer
Pre-construction Phase	Environment and social safeguard not included in contract documents.	Inclusion of ESMP as an integral part of contract clause.	<ul style="list-style-type: none"> • Inclusion of ESMP as an integral part of contract clause. • Inclusion of needs or expressions of the vulnerable groups • Address conflict of interest in ESMP. • Provide maximum employment of local people. • Ensure participation of women in planning, and 	Once during the first bidding	DAO & Engineer, Haa Dz; contractor

Table 11: Summarized version of environmental and Social Plan (ESMP) for FSAPP for selected civil and technologies under additional financing .

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<p>decision making of subproject</p> <ul style="list-style-type: none"> • Address special needs of the vulnerable groups and implement. • COVID-19 be included in the contract documents and be followed accordingly that includes an isolation facility in case of outbreak or to quarantine individuals coming from high-risk zones of COVID-19. • Make sure all workers, visitors and related staff follow hand and respiratory hygiene and other covid protocols. 		
Construction Phase	Weak building foundation at the lower sides at Sangbay Ama. Other two sites are on flat land.	Concretize foundation pillars supporting the building base at lower sides.	<ul style="list-style-type: none"> • Make sure ES included in contract. • Address conflict of interest in ESMP. • Maximum employment of local people. • Ensure participation of women in planning, and decision making of subproject 	During design & during construction	DAO & Engineer, Haa Dz; contractor

Table 11: Summarized version of environmental and Social Plan (ESMP) for FSAPP for selected civil and technologies under additional financing .

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> Address special needs of the vulnerable groups and implement Make sure to include detailed COVID-19 protocols in the contract documents. 		Dzongkhag Environmental Officer
	Unstable land above and below construction site at Sangbay Ama	<ul style="list-style-type: none"> Construct RCC retaining wall on both sides at Sangbay Ama Ensure the protection of f by constructing protection barriers above Sombaykha Dungkhag sites and also Amo riverbank from below (This has to be taken up with long time period with budget from central government) It is beyond the scope of FSAPP. River embankment should be constructed along Haa Chu to protect possible risks of flooding at planned FPH site at Eusu Geog /RNR centre. 	<ul style="list-style-type: none"> Consultation with engineers & contractor. Ensure participation of women in planning, and decision making of subprojects. Provide special needs of the vulnerable groups and implement. Make all necessary arrangement as per national COVID-19 guidelines. 	During design & construction	DAO & Engineer, Haa Dz; contractor
	Draining of polluted water from PHs	Disposed water from PHs through piped systems or RCC drainage system. Treat water through soaked pit system prior to release in natural system. Water can be	<ul style="list-style-type: none"> Ensure that used water from PH or FPH is purified in a soaked pit and should be included in the design of PH/FPH 	Consider designing during contract work.	DAO & Engineer, Haa Dz; contractor

Table 11: Summarized version of environmental and Social Plan (ESMP) for FSAPP for selected civil and technologies under additional financing .

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBI LITY
		treated and reused for irrigations if the surrounding areas are agricultural field especially at Sangbay Ama.	<ul style="list-style-type: none"> Any used water from PH or FP H not exposed workers or community to any water related hazard/diseases. Ensure participation of women in planning, and decision making of subprojects. Make sure all provisions of EA are followed. 		Dzongkhag Environmen tal Officer
	Prevalent of dust pollution	Sprinkle water on need basis	<ul style="list-style-type: none"> Do not allow members of public to loiter around construction sites. – Use face masks by construction workers & commuters. Prevent dust related diseases to surface in the construction sites. 	Daily/weekly depending on dust level.	Contractor Dzongkhag Environmen tal Officer
	Haphazard stacking of construction materials	Construction materials stacked in proper enclosures	<ul style="list-style-type: none"> Do not allow members of public to loiter around construction sites. Ensure construction materials related diseases/sickness do not prevail on the construction sites. 	Daily/weekly	Contractor and CA

Table 11: Summarized version of environmental and Social Plan (ESMP) for FSAPP for selected civil and technologies under additional financing .

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Ensure participation of women in planning, and decision making of subprojects. • Address special needs of the vulnerable groups and implement. • Make sure the construction workers use face masks all times. 		
	Increase level of traffic congestion	Avoid traffic congestion	<ul style="list-style-type: none"> • Display proper safety signs. • Safety signs and should be disabled persons friendly. • Traffic congestion should not expose vulnerable groups to disadvantageous position. 	Daily/weekly	Contractor and CA
	Lack of gender sensitive toilets	Construction of attached toilets for men & women separately	<ul style="list-style-type: none"> • Place picture men & women in front of each door. • Ensure participation of women in planning, and decision making of subprojects. • Inclusion of needs or expressions of the vulnerable groups. • Address conflict of interest in ESMP. 	At the beginning of construction	Contractor and CA

Table 11: Summarized version of environmental and Social Plan (ESMP) for FSAPP for selected civil and technologies under additional financing .

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Education, awareness, and accessibility control • Maximum employment of local people. 		
	Inadequacy in building design	Strictly follow building Rules (LG/Central). Site beautification with flowers	<ul style="list-style-type: none"> • Consult locals on local traditions on construction. • Education, awareness, and accessibility control. • Inclusion of needs or expressions of the vulnerable groups in the ESMP for implement. • Address conflict of interest in ESMP. • Provide maximum employment of local people • . Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 	Monthly	Contractor and CA
	Not reliable Electricity	Connecting electric wire to construction site should be done professionally, cover the electric	<ul style="list-style-type: none"> • Make sure the electric connection will be made available to all workers during 	Daily/weekly	Contractor and CA

Table 11: Summarized version of environmental and Social Plan (ESMP) for FSAPP for selected civil and technologies under additional financing .

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
	connections and supply.	wire joints with proper insulating tapes	<p>construction for various purposes.</p> <ul style="list-style-type: none"> • Deployment of gender sensitive appliances. • Education, awareness, and accessibility control. • Inclusion of needs or expressions of the vulnerable groups 		
	Polluted/dirty Drinking water	Reliable water connection	<ul style="list-style-type: none"> • Encourage and make sure that workers drink boiled water. • Make sure water borne diseases are not prevalent in the construction sites. • Ensure the after used water do not pollute other water resources downstream. 	Daily/weekly	Contractor and CA
	Existence of fire hazard	Place Fire safety measures at from beginning of the construction	<ul style="list-style-type: none"> • Do not let construction workers to make open fire without proper safety in place • designate area for cooking if firewood is use, away from construction site. 	Daily/weekly	Contractor and CA

Table 11: Summarized version of environmental and Social Plan (ESMP) for FSAPP for selected civil and technologies under additional financing .

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Keep firefighting equipment ready and trained people on how to use prior to construction. • Education, awareness and accessibility control. • Inclusion of needs or expressions of the vulnerable groups • The burning of trashes in all forms should be avoided. 		
Post-construction Phase	Improper waste management/waste generation	-Adequate number of waste bins (biodegradable and non-degradable and disposed them in designated areas. Do not burn the both non-bio-degradable and biodegradable wastes.	<ul style="list-style-type: none"> • monthly disposal wastes in safe designated areas • SOP to give employment & income generation priority to enterprising cooperatives/farmers groups with women/youth. • Education, awareness and accessibility control. 	Once a month from DAO or extension staff	Caretaker/m anagement
	SOP non-compliance		<ul style="list-style-type: none"> • Effective SOP strategy for management/business 	Daily/Weekly	DOA & caretaker managemen t

Table 11: Summarized version of environmental and Social Plan (ESMP) for FSAPP for selected civil and technologies under additional financing .

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
Post construction	Exposed soils, unused construction materials	<ul style="list-style-type: none"> • Proper disposal of waste in designated areas • Restoration of surrounding lands with beatification and plantation activities 	<ul style="list-style-type: none"> • Ensure safely disposal of construction materials without compromising the health and safety of the communities 		
Micro-irrigation					
Drip & sprinklers technologies	Inefficient water use	<ul style="list-style-type: none"> • Do not overdraw water from the nearby stream. Leave 30% environment flow. • Ensure proper outlet drains from farms to prevent overflow and seepage water from the field disturbing neighbouring farms/hhs. <p>-Do not use chemicals & pesticides in farms where micro irrigation is used.</p>	<ul style="list-style-type: none"> • Ensure equal distribution of micro-irrigation facilities to water deficit including farmers groups (poor, youth, women). • Inclusion of needs or expressions of the vulnerable groups. • Education, awareness and accessibility control. • Address conflict of interest in ESMP. Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 	Weekly/monthly	Individual farmers, extension agents, NCOA Yusipang,

Table 11: Summarized version of environmental and Social Plan (ESMP) for FSAPP for selected civil and technologies under additional financing .

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
Rain water harvesting technologies	Water scarcity	<ul style="list-style-type: none"> • Ensure fencing of ponds with wooden poles and barbed wires to prevent accidents. • Ensure proper disposal & burning of old plastics. 	<ul style="list-style-type: none"> • Create awareness to prevent children and cattle accidents. Inclusion of needs or expressions of the vulnerable groups. • Education, awareness and accessibility control. • Address conflict of interest in ESMP. Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 	Once a month.	Individual farmers, extension agents, NCOA, Yusipang.
Green house technologies	Plastic waste and other metallic waste	<ul style="list-style-type: none"> • Ensure sustainability by using a mix of local and imported materials • Ensure proper disposal & recycling of plastics and other non-biodegradable waste is highly discourage. 	<ul style="list-style-type: none"> • Ensure equal distribution of greenhouse technologies to farmers group (poor, youth, women). • Education, awareness and accessibility control. • Address conflict of interest in ESMP. Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. 	Quarterly	Individual farmers, extension agents, NCOA Yusipang.

Table 11: Summarized version of environmental and Social Plan (ESMP) for FSAPP for selected civil and technologies under additional financing .

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> Promote special needs of the vulnerable groups and implement. 		
Electric/solar fencing technologies	<p>Various models of electric fencing with less due respect for environment concerns such as excessive harvesting of trees for fencing poles.-Rusting of low-quality wires.</p> <p>-limited responsibility by beneficiaries</p>	<ul style="list-style-type: none"> Electric/solar fence with galvanized wires & copper earthen plates with high quality energizer Green live fencing of thorny plants Collaborative group works - safe to human & animals (1-2 joules energy supplies 	<ul style="list-style-type: none"> Ensure equal distribution of solar/electric fencing technologies to farmers group (poor, youth, women). Inclusion of needs or expressions of the vulnerable groups. Education, awareness and accessibility control. Address conflict of interest in ESMP. Maximum employment of local people. Ensure participation of women in planning, and decision making of subprojects. Promote special needs of the vulnerable groups and implement. 	Daily	Individual farmers, extension agents, NCOA Yusipang.
Small farm machineries					
Power tillers, drum seeders & weeders	<ul style="list-style-type: none"> Poor operation & maintenance Rampant disposal of oils, lubricants, plastic& metals, 	<ul style="list-style-type: none"> Training on O & M plan Proper disposal of oils, lubricants, plastic& metals Reduction of noise and gaseous pollution 	<ul style="list-style-type: none"> Ensure equal distribution of farm machineries and other farm technologies to farmers group (poor, youth, women). Inclusion of needs or expressions of the vulnerable groups. 	Quarterly	Individual farmers, extension agents, Dzongkhags, private

Table 11: Summarized version of environmental and Social Plan (ESMP) for FSAPP for selected civil and technologies under additional financing .

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
	noise and gaseous pollution		<ul style="list-style-type: none"> • Education, awareness and accessibility control. • Address conflict of interest in ESMP. Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. • Provide special needs of the vulnerable groups and implement. 		sectors &, FMCL offices
Post-harvest drying units					
Drying cardamom	Excessive harvesting of trees from the surroundings	<ul style="list-style-type: none"> • Sustainable use of biomass/electrical drying ovens. • Harvest trees from sustainably managed forests • Encourage people to plant more fuelwood trees • Make use of residues such as ash and charcoal in the farms. 	<ul style="list-style-type: none"> • Ensure equal distribution of ovens to farmers group /individual (poor, youth, women). • Inclusion of needs or expressions of the vulnerable groups • Make sure workers donot exposed to excessive heat. • Education, awareness and accessibility control. • Address conflict of interest in ESMP. 	Daily/Weekly	Individual/farmers group, NPHC, DAMC, DAO

Table 11: Summarized version of environmental and Social Plan (ESMP) for FSAPP for selected civil and technologies under additional financing .

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. • Provide special needs of the vulnerable groups and implement. 		

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
DAGANA DZONGKHAG					
Centralized Pack House and COLD STORE AT DAGAPELA (NPHC-SC) Pre-construction Phase	Land acquisition may take away private properties	Land public Clearance	Free, prior and informed consent/agreement	Once prior to construction	DAO & Engineer, Dagana Dz; contractor Dzongkhag Environmental Officer
	Environment and social safeguard not included in contract documents.	Inclusion of ESMP as an integral part of contract clause.	<ul style="list-style-type: none"> • Inclusion of ESMP as an integral part of contract clause. • Inclusion of needs or expressions of the vulnerable groups • Address conflict of interest in ESMP. • Provide maximum employment of local people. • Ensure participation of women in planning, and decision making of subproject • Address special needs of the vulnerable groups and implement. 	Once during the first bidding	DAO & Engineer, Dagana Dz; contractor

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> COVID-19 be included in the contract documents and be followed accordingly that includes an isolation facility in case of outbreak or to quarantine individuals coming from high risk zones of COVID-19. Make sure all workers, visitors and related staff follow hand and respiratory hygiene and other covid protocols. 		
Construction Phase	Unstable slope on the upper part of proposed CS and CPH	Construct RCC retaining wall with deep drain at its base to drain out water from interflow from upper slope.	<ul style="list-style-type: none"> Make sure ES included in contract. Address conflict of interest in ESMP. Maximum employment of local people. Ensure participation of women in planning, and decision making of subproject Address special needs of the vulnerable groups and implement Make sure to include detailed COVID-19 protocols in the contract documents. 	During design & during construction	DAO & Engineer, Dagana Dz; contractor Dzongkhag Environmental Officer

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
	Unstable land above and below construction site	<ul style="list-style-type: none"> • Make sure the drain water goes to nearby lake 	<ul style="list-style-type: none"> • Consultation with engineers & contractor. • Ensure participation of women in planning, and decision making of subprojects. • Provide special needs of the vulnerable groups and implement. • Make all necessary arrangement as per national COVID-19 guidelines. 	During design & construction	DAO & Engineer, Dagana Dz; contractor
	Draining of polluted water from PHs	Disposed water from PHs through piped systems or RCC drainage system. Treat water through soaked pit system prior to release in natural system. Water can be treated and reused for irrigations in the nearby agriculture fields.	<ul style="list-style-type: none"> • Ensure that used water from PH or FPH is purified in a soaked pit and should be included in the design of PH/FPH • Any used water from PH or FPH not exposed workers or community to any water related hazard/diseases. • Ensure participation of women in planning, and decision making of subprojects. • Make sure all provisions of EA are followed. 	Consider designing during contract work.	DAO & Engineer, Dagana Dz; contractor Dzongkhag Environmental Officer
	Prevalent of dust pollution	Sprinkle water on need basis	<ul style="list-style-type: none"> • Do not allow members of public to loiter around construction sites. – • Use face masks by construction workers & commuters. 	Daily/weekly depending on dust level.	Contractor Dzongkhag Environmental Officer

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> Prevent dust related diseases to surface in the construction sites. 		
	Haphazard stacking of construction materials	Construction materials stacked in proper enclosures	<ul style="list-style-type: none"> Do not allow members of public to loiter around construction sites. Ensure construction materials related diseases/sickness do not prevail on the construction sites. Ensure participation of women in planning, and decision making of subprojects. Address special needs of the vulnerable groups and implement. Make sure the construction workers use face masks all times. 	Daily/weekly	Contractor and CA
	Increase level of traffic congestion	Avoid traffic congestion	<ul style="list-style-type: none"> Display proper safety signs. Safety signs and should be disabled persons friendly. Traffic congestion should not expose vulnerable groups to disadvantageous position. 	Daily/weekly	Contractor and CA

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
	Lack of gender sensitive toilets	Construction of attached toilets for men & women separately	<ul style="list-style-type: none"> Place picture men & women in front of each door. Ensure participation of women in planning, and decision making of subprojects. Inclusion of needs or expressions of the vulnerable groups. Address conflict of interest in ESMP. Education, awareness, and accessibility control Maximum employment of local people. 	At the beginning of construction	Contractor and CA
	Inadequacy in building design	<p>Strictly follow building Rules (LG/Central).</p> <p>Site beautification with flowers</p>	<ul style="list-style-type: none"> Consult locals on local traditions on construction. Education, awareness, and accessibility control. Inclusion of needs or expressions of the vulnerable groups in the ESMP for implement. Address conflict of interest in ESMP. Provide maximum employment of local people 	Monthly	Contractor and CA

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • . Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 		
	Not reliable Electricity connections and supply.	Connecting electric wire to construction site should be done professionally, cover the electric wire joints with proper insulating tapes	<ul style="list-style-type: none"> • Make sure the electric connection will be made available to all workers during construction for various purposes. • Deployment of gender sensitive appliances. • Education, awareness, and accessibility control. • Inclusion of needs or expressions of the vulnerable groups 	Daily/weekly	Contractor and CA
	Polluted/dirty Drinking water	Reliable water connection	<ul style="list-style-type: none"> • Encourage and make sure that workers drink boiled water. • Make sure water borne diseases are not prevalent in the construction sites. • Ensure the after used water do not pollute other water resources downstream. 	Daily/weekly	Contractor and CA

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
	Existence of fire hazard	Place Fire safety measures at from beginning of the construction	<ul style="list-style-type: none"> • Do not let construction workers to make open fire without proper safety in place • designate area for cooking if firewood is use, away from construction site. • Keep firefighting equipment ready and trained people on how to use prior to construction. • Education, awareness and accessibility control. • Inclusion of needs or expressions of the vulnerable groups • The burning of trashes in all forms should be avoided. 	Daily/weekly	Contractor and CA
Post-construction Phase	Improper waste management/waste generation	-Adequate number of waste bins (biodegradable and non-degradable and disposed them in designated areas. Do not burn the both non-bio-degradable and biodegradable wastes.	<ul style="list-style-type: none"> • monthly disposal wastes in safe designated areas • SOP to give employment & income generation priority to enterprising cooperatives/farmers groups with women/youth. • Education, awareness and accessibility control. 	Once a month from DAO or extension staff	Caretaker/management

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
	SOP non-compliance		<ul style="list-style-type: none"> Effective SOP strategy for management/business 	Daily/Weekly	DOA & caretaker management
Post construction	Exposed soils, unused construction materials	<ul style="list-style-type: none"> Proper disposal of waste in designated areas Restoration of surrounding lands with beatification and plantation activities 	<ul style="list-style-type: none"> Ensure safely disposal of construction materials without compromising the health and safety of the communities 	Once after completion and daily	Caretaker
Micro-irrigation					
Drip & sprinklers technologies	Inefficient water use	<ul style="list-style-type: none"> Do not overdraw water from the nearby stream. Leave 30% environment flow. Ensure proper outlet drains from farms to prevent overflow and seepage water from the field disturbing neighbouring farms/hhs. <p>-Do not use chemicals & pesticides in farms where micro irrigation is used.</p>	<ul style="list-style-type: none"> Ensure equal distribution of micro-irrigation facilities to water deficit including farmers groups (poor, youth, women). Inclusion of needs or expressions of the vulnerable groups. Education, awareness and accessibility control. Address conflict of interest in ESMP. Maximum employment of local people. Ensure participation of women in planning, and decision making of subprojects. 	Weekly/monthly	Individual farmers, extension agents, ARDC Bajo

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> Promote special needs of the vulnerable groups and implement. 		
Rain water harvesting technologies	Water scarcity	<ul style="list-style-type: none"> Ensure fencing of ponds with wooden poles and barbed wires to prevent accidents. Ensure proper disposal & burning of old plastics. 	<ul style="list-style-type: none"> Create awareness to prevent children and cattle accidents. Inclusion of needs or expressions of the vulnerable groups. Education, awareness and accessibility control. Address conflict of interest in ESMP. Maximum employment of local people. Ensure participation of women in planning, and decision making of subprojects. Promote special needs of the vulnerable groups and implement. 	Once a month.	Individual farmers, extension agents, ARDC Bajo
Restoring natural lakes	Water scarcity and poor access to water for agriculture productivity	<ul style="list-style-type: none"> Ensure adequate water in aquifers through artificial recharging system 	<ul style="list-style-type: none"> Create awareness to prevent children and cattle accidents. Inclusion of needs or expressions of the vulnerable groups. Education, awareness and accessibility control. Address conflict of interest in ESMP. Maximum employment of local people. 	Weekly/monthly	DAO, Dzongkhag Watershed management Division (DoFPS) Farmers

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement 		
Green house technologies	Plastic waste and other metallic waste	<ul style="list-style-type: none"> • Ensure sustainability by using a mix of local and imported materials • Ensure proper disposal & recycling of plastics and other non-biodegradable waste is highly discourage. 	<ul style="list-style-type: none"> • Ensure equal distribution of greenhouse technologies to farmers group (poor, youth, women). • Education, awareness and accessibility control. • Address conflict of interest in ESMP. Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 	Quarterly	Individual farmers, extension agents, ARDC Bajo.
Electric/solar fencing technologies	Various models of electric fencing with less due respect for environment concerns such as excessive harvesting of trees for fencing poles.-Rusting of low-quality wires.	<ul style="list-style-type: none"> • Electric/solar fence with galvanized wires & copper earthen plates with high quality energizer • Green live fencing of thorny plants 	<ul style="list-style-type: none"> • Ensure equal distribution of solar/electric fencing technologies to farmers group (poor, youth, women). • Inclusion of needs or expressions of the vulnerable groups. • Education, awareness and accessibility control. • Address conflict of interest in ESMP. Maximum employment of local people. 	Daily	Individual farmers, extension agents, ARDC Bajo

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
	-limited responsibility by beneficiaries	<ul style="list-style-type: none"> • Collaborative group works - safe to human & animals (1-2 joules energy supplies 	<ul style="list-style-type: none"> • Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 		
Small Farm Machineries					
Power tillers, drum seeders & weeders	<ul style="list-style-type: none"> • Poor operation & maintenance • Rampant disposal of oils, lubricants, plastic& metals, noise and gaseous pollution 	<ul style="list-style-type: none"> • Training on O & M plan • Proper disposal of oils, lubricants, plastic& metals • Reduction of noise and gaseous pollution 	<ul style="list-style-type: none"> • Ensure equal distribution of farm machineries and other farm technologies to farmers group (poor, youth, women). • Inclusion of needs or expressions of the vulnerable groups. • Education, awareness and accessibility control. • Address conflict of interest in ESMP. Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. • Provide special needs of the vulnerable groups and implement. 	Quarterly	Individual farmers, extension agents, Dzongkhags, private sectors &, FMCL offices
Post-harvest drying units					

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
Drying cardamom	Excessive harvesting of trees from the surroundings	<ul style="list-style-type: none"> Sustainable use of biomass/electrical drying ovens. Harvest trees from sustainably managed forests Encourage people to plant more fuelwood trees Make use of residues such as ash and charcoal in the farms. 	<ul style="list-style-type: none"> Ensure equal distribution of ovens to farmers group /individual (poor, youth, women). Inclusion of needs or expressions of the vulnerable groups Make sure workers donot exposed to excessive heat. Education, awareness and accessibility control. Address conflict of interest in ESMP. Maximum employment of local people. Ensure participation of women in planning, and decision making of subprojects. Provide special needs of the vulnerable groups and implement. 	Daily/Weekly	Individual/farm ers group, NPHC, DAMC, DAO, ARDC Bajo
Drying Onion	Unable to dry onion in time promotes rots and post-harvest loss and	<ul style="list-style-type: none"> Air dry onions in properly ventilated air drying facilities 	<ul style="list-style-type: none"> Ensure equal access o drying facilities by onion growing farmers group /individual (poor, youth, women). 	Daily/Weekly	Individual farmers

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
	income to the farmers		<ul style="list-style-type: none"> • Inclusion of needs or expressions of the vulnerable groups • Education, awareness and accessibility control. • Address conflict of interest in ESMP. • Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. • Provide special needs of the vulnerable groups and implement. 		

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
SAMTSE DZONGKHAG					
Centralized Pack House and Cold Store at Buduney (RNR Technology Park) Pre-construction Phase	Land acquisition may take away private properties	Land public Clearance	Free, prior and informed consent/agreement	Once prior to construction	DAO & Engineer, Samtse Dz; contractor Dzongkhag Environmental Officer
	Environment and social safeguard not included in contract documents.	Inclusion of ESMP as an integral part of contract clause.	<ul style="list-style-type: none"> • Inclusion of ESMP as an integral part of contract clause. • Inclusion of needs or expressions of the vulnerable groups • Address conflict of interest in ESMP. • Provide maximum employment of local people. • Ensure participation of women in planning, and decision making of subproject 	Once during the first bidding	DAO & Engineer, Samtse Dz; contractor

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> Address special needs of the vulnerable groups and implement. COVID-19 be included in the contract documents and be followed accordingly that includes an isolation facility in case of outbreak or to quarantine individuals coming from high-risk zones of COVID-19. Make sure all workers, visitors and related staff follow hand and respiratory hygiene and other covid protocols. 		
Construction Phase	Unstable slope on the upper part and lower part of proposed CS and CPH	Construct RCC retaining wall with deep drain at its base to drained out water from interflow from upper slope.	<ul style="list-style-type: none"> Make sure ES included in contract. Address conflict of interest in ESMP. Maximum employment of local people. Ensure participation of women in planning, and decision making of subproject Address special needs of the vulnerable groups and implement 	During design & during construction	DAO & Engineer, Samtse Dz; contractor Dzongkhag Environmental Officer

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> Make sure to include detailed COVID-19 protocols in the contract documents. 		
	Unstable land above and below construction site	<ul style="list-style-type: none"> Make sure the drain water goes 	<ul style="list-style-type: none"> Consultation with engineers & contractor. Ensure participation of women in planning, and decision making of subprojects. Provide special needs of the vulnerable groups and implement. Make all necessary arrangement as per national COVID-19 guidelines. 	During design & construction	DAO & Engineer, Samtse Dz; contractor
	Draining of polluted water from PHs	Disposed water from PHs through piped systems or RCC drainage system. Treat water through soaked pit system prior to release in natural system. Water can be treated and reused for irrigations in the nearby agriculture fields.	<ul style="list-style-type: none"> Ensure that used water from PH or FPH is purified in a soaked pit and should be included in the design of PH/FPH Any used water from PH or FP H not exposed workers or community to any water related hazard/diseases. Ensure participation of women in planning, and decision making of subprojects. Make sure all provisions of EA are followed. 	Consider designing during contract work.	DAO & Engineer, Samtse Dz; contractor Dzongkhag Environmental Officer
	Prevalent of dust pollution	Sprinkle water on need basis	<ul style="list-style-type: none"> Do not allow members of public to loiter around construction sites. – 	Daily/weekly depending on dust level.	Contractor Dzongkhag Environmental Officer

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Use face masks by construction workers & commuters. • Prevent dust related diseases to surface in the construction sites. 		
	Haphazard stacking of construction materials	Construction materials stacked in proper enclosures	<ul style="list-style-type: none"> • Do not allow members of public to loiter around construction sites. • Ensure construction materials related diseases/sickness do not prevail on the construction sites. • Ensure participation of women in planning, and decision making of subprojects. • Address special needs of the vulnerable groups and implement. • Make sure the construction workers use face masks all times. 	Daily/weekly	Contractor and CA
	Increase level of traffic congestion	Avoid traffic congestion	<ul style="list-style-type: none"> • Display proper safety signs. • Safety signs and should be disabled persons friendly. 	Daily/weekly	Contractor and CA

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> Traffic congestion should not expose vulnerable groups to disadvantageous position. 		
	Lack of gender sensitive toilets	Construction of attached toilets for men & women separately	<ul style="list-style-type: none"> Place picture men & women in front of each door. Ensure participation of women in planning, and decision making of subprojects. Inclusion of needs or expressions of the vulnerable groups. Address conflict of interest in ESMP. Education, awareness, and accessibility control Maximum employment of local people. 	At the beginning of construction	Contractor and CA
	Inadequacy in building design	<p>Strictly follow building Rules (LG/Central).</p> <p>Site beautification with flowers</p>	<ul style="list-style-type: none"> Consult locals on local traditions on construction. Education, awareness, and accessibility control. Inclusion of needs or expressions of the vulnerable groups in the ESMP for implement. 	Monthly	Contractor and CA

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Address conflict of interest in ESMP. • Provide maximum employment of local people • . Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 		
	Not reliable Electricity connections and supply.	Connecting electric wire to construction site should be done professionally, cover the electric wire joints with proper insulating tapes	<ul style="list-style-type: none"> • Make sure the electric connection will be made available to all workers during construction for various purposes. • Deployment of gender sensitive appliances. • Education, awareness, and accessibility control. • Inclusion of needs or expressions of the vulnerable groups 	Daily/weekly	Contractor and CA
	Polluted/dirty Drinking water	Reliable water connection	<ul style="list-style-type: none"> • Encourage and make sure that workers drink boiled water. • Make sure water borne diseases are not prevalent in the construction sites. 	Daily/weekly	Contractor and CA

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Ensure the after used water do not pollute other water resources downstream. 		
	Existence of fire hazard	Place Fire safety measures at from beginning of the construction	<ul style="list-style-type: none"> • Do not let construction workers to make open fire without proper safety in place • designate area for cooking if firewood is use, away from construction site. • Keep firefighting equipment ready and trained people on how to use prior to construction. • Education, awareness and accessibility control. • Inclusion of needs or expressions of the vulnerable groups • The burning of trashes in all forms should be avoided. 	Daily/weekly	Contractor and CA
Post-construction Phase	Improper waste management/waste generation	-Adequate number of waste bins (biodegradable and non-degradable and disposed them in designated areas. Do not burn the both non-bio-degradable and biodegradable wastes.	<ul style="list-style-type: none"> • monthly disposal wastes in safe designated areas • SOP to give employment & income generation priority to enterprising cooperatives/farmers groups with women/youth. 	Once a month from DAO or extension staff	Caretaker/ management

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> Education, awareness and accessibility control. 		
	SOP non-compliance		<ul style="list-style-type: none"> Effective SOP strategy for management/business 	Daily/Weekly	DOA & caretaker management
Post construction Phase	Exposed soils, unused construction materials	<ul style="list-style-type: none"> Proper disposal of waste in designated areas Restoration of surrounding lands with beatification and plantation activities 	<ul style="list-style-type: none"> Ensure safely disposal of construction materials without compromising the health and safety of the communities 	Once after completion and daily	Caretaker
Micro-irrigation					
Drip & sprinklers technologies	Inefficient water use	<ul style="list-style-type: none"> Do not overdraw water from the nearby stream. Leave 30% environment flow. Ensure proper outlet drains from farms to prevent overflow and seepage water from the field disturbing neighbouring farms/hhs. <p>-Do not use chemicals & pesticides in farms where micro irrigation is used.</p>	<ul style="list-style-type: none"> Ensure equal distribution of micro-irrigation facilities to water deficit including farmers groups (poor, youth, women). Inclusion of needs or expressions of the vulnerable groups. Education, awareness and accessibility control. Address conflict of interest in ESMP. Maximum employment of local people. 	Weekly/monthly	Individual farmers, extension agents, ARDC Samtenling

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 		
Rain water harvesting technologies	Water scarcity	<ul style="list-style-type: none"> • Ensure fencing of ponds with wooden poles and barbed wires to prevent accidents. • Ensure proper disposal & burning of old plastics. 	<ul style="list-style-type: none"> • Create awareness to prevent children and cattle accidents. Inclusion of needs or expressions of the vulnerable groups. • Education, awareness and accessibility control. • Address conflict of interest in ESMP. Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 	Once a month.	Individual farmers, extension agents, ARDC Samtenling
Green house technologies	Plastic waste and other metallic waste	<ul style="list-style-type: none"> • Ensure sustainability by using a mix of local and imported materials • Ensure proper disposal & recycling of plastics and other non-biodegradable waste is highly discourage. 	<ul style="list-style-type: none"> • Ensure equal distribution of greenhouse technologies to farmers group (poor, youth, women). • Education, awareness and accessibility control. • Address conflict of interest in ESMP. Maximum employment of local people. 	Quarterly	Individual farmers, extension agents, ARDC Samtenling.

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 		
Electric/solar fencing technologies	<p>Various models of electric fencing with less due respect for environment concerns such as excessive harvesting of trees for fencing poles.-Rusting of low-quality wires.</p> <p>-limited responsibility by beneficiaries</p>	<ul style="list-style-type: none"> • Electric/solar fence with galvanized wires & copper earthen plates with high quality energizer • Green live fencing of thorny plants • Collaborative group works - safe to human & animals (1-2 joules energy supplies 	<ul style="list-style-type: none"> • Ensure equal distribution of solar/electric fencing technologies to farmers group (poor, youth, women). • Inclusion of needs or expressions of the vulnerable groups. • Education, awareness and accessibility control. • Address conflict of interest in ESMP. Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 	Daily	Individual farmers, extension agents, ARDC Samtenling
Small Farm Machineries					
Power tillers, drum seeders & weeders	<ul style="list-style-type: none"> • Poor operation & maintenance • Rampant disposal of oils, lubricants, plastic& metals, 	<ul style="list-style-type: none"> • Training on O & M plan • Proper disposal of oils, lubricants, plastic& metals 	<ul style="list-style-type: none"> • Ensure equal distribution of farm machineries and other farm technologies to farmers group (poor, youth, women). • Inclusion of needs or expressions of the vulnerable groups. 	Quarterly	Individual farmers, extension agents, Dzongkhags, private

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
	noise and gaseous pollution	<ul style="list-style-type: none"> Reduction of noise and gaseous pollution 	<ul style="list-style-type: none"> Education, awareness and accessibility control. Address conflict of interest in ESMP. Maximum employment of local people. Ensure participation of women in planning, and decision making of subprojects. Provide special needs of the vulnerable groups and implement. 		sectors &, FMCL offices
Post-harvest drying units					
Drying cardamom	Excessive harvesting of trees from the surroundings	<ul style="list-style-type: none"> Sustainable use of biomass/electrical drying ovens. Harvest trees from sustainably managed forests Encourage people to plant more fuelwood trees Make use of residues such as ash and charcoal in the farms. 	<ul style="list-style-type: none"> Ensure equal distribution of ovens to farmers group /individual (poor, youth, women). Inclusion of needs or expressions of the vulnerable groups Make sure workers donot exposed to excessive heat. Education, awareness and accessibility control. Address conflict of interest in ESMP. Maximum employment of local people. 	Daily/Weekly	Individual/f armers group, NPHC, DAMC, DAO, ARDC Samtenling

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> Ensure participation of women in planning, and decision making of subprojects. Provide special needs of the vulnerable groups and implement. 		
SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
SAMTSE DZONGKHAG					
Field Pack Houses at Yoeltse Geog Centre and Depheling Maed at Sanga-Nga Choling Geog Pre-construction Phase	Land acquisition may take away private properties	Land public Clearance	Free, prior and informed consent/agreement	Once prior to construction	DAO & Engineer, Samtse Dz; contractor Dzongkhag Environmental Officer
	Environment and social safeguard not included in contract documents.	Inclusion of ESMP as an integral part of contract clause.	<ul style="list-style-type: none"> Inclusion of ESMP as an integral part of contract clause. Inclusion of needs or expressions of the vulnerable groups Address conflict of interest in ESMP. 	Once during the first bidding	DAO & Engineer, Samtse Dz; contractor

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Provide maximum employment of local people. • Ensure participation of women in planning, and decision making of subproject • Address special needs of the vulnerable groups and implement. • COVID-19 be included in the contract documents and be followed accordingly that includes an isolation facility in case of outbreak or to quarantine individuals coming from high-risk zones of COVID-19. • Make sure all workers, visitors and related staff follow hand and respiratory hygiene and other covid protocols. 		
Construction Phase	Unstable slope on the upper part and lower part of proposed CS and CPH	Construct RCC retaining wall with deep drain at its base to drained out water from interflow from upper slope.	<ul style="list-style-type: none"> • Make sure ES included in contract. • Address conflict of interest in ESMP. • Maximum employment of local people. 	During design & during construction	DAO & Engineer, Samtse Dz; contractor

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Ensure participation of women in planning, and decision making of subproject • Address special needs of the vulnerable groups and implement • Make sure to include detailed COVID-19 protocols in the contract documents. 		Dzongkhag Environmental Officer
	Unstable land above and below construction site	<ul style="list-style-type: none"> • Make sure the drain water goes 	<ul style="list-style-type: none"> • Consultation with engineers & contractor. • Ensure participation of women in planning, and decision making of subprojects. • Provide special needs of the vulnerable groups and implement. • Make all necessary arrangement as per national COVID-19 guidelines. 	During design & construction	DAO & Engineer, Samtse Dz; contractor
	Draining of polluted water from PHs	Disposed water from PHs through piped systems or RCC drainage system. Treat water through soaked pit system prior to release in natural system. Water can be treated and reused for irrigations in the nearby agriculture fields.	<ul style="list-style-type: none"> • Ensure that used water from PH or FPH is purified in a soaked pit and should be included in the design of PH/FPH • Any used water from PH or FPH not exposed workers or community to any water related hazard/diseases. • Ensure participation of women in planning, and decision making of subprojects. • Make sure all provisions of EA are followed. 	Consider designing during contract work.	DAO & Engineer, Samtse Dz; contractor Dzongkhag Environmental Officer

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
	Prevalent of dust pollution	Sprinkle water on need basis	<ul style="list-style-type: none"> Do not allow members of public to loiter around construction sites. – Use face masks by construction workers & commuters. Prevent dust related diseases to surface in the construction sites. 	Daily/weekly depending on dust level.	Contractor Dzongkhag Environmental Officer
	Haphazard stacking of construction materials	Construction materials stacked in proper enclosures	<ul style="list-style-type: none"> Do not allow members of public to loiter around construction sites. Ensure construction materials related diseases/sickness do not prevail on the construction sites. Ensure participation of women in planning, and decision making of subprojects. Address special needs of the vulnerable groups and implement. Make sure the construction workers use face masks all times. 	Daily/weekly	Contractor and CA
	Increase level of traffic congestion	Avoid traffic congestion	<ul style="list-style-type: none"> Display proper safety signs. 	Daily/weekly	Contractor and CA

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Safety signs and should be disabled persons friendly. • Traffic congestion should not expose vulnerable groups to disadvantageous position. 		
	Lack of gender sensitive toilets	Construction of attached toilets for men & women separately	<ul style="list-style-type: none"> • Place picture men & women in front of each door. • Ensure participation of women in planning, and decision making of subprojects. • Inclusion of needs or expressions of the vulnerable groups. • Address conflict of interest in ESMP. • Education, awareness, and accessibility control • Maximum employment of local people. 	At the beginning of construction	Contractor and CA
	Inadequacy in building design	Strictly follow building Rules (LG/Central). Site beautification with flowers	<ul style="list-style-type: none"> • Consult locals on local traditions on construction. • Education, awareness, and accessibility control. 	Monthly	Contractor and CA

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Inclusion of needs or expressions of the vulnerable groups in the ESMP for implement. • Address conflict of interest in ESMP. • Provide maximum employment of local people • . Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 		
	Not reliable Electricity connections and supply.	Connecting electric wire to construction site should be done professionally, cover the electric wire joints with proper insulating tapes	<ul style="list-style-type: none"> • Make sure the electric connection will be made available to all workers during construction for various purposes. • Deployment of gender sensitive appliances. • Education, awareness, and accessibility control. • Inclusion of needs or expressions of the vulnerable groups 	Daily/weekly	Contractor and CA
	Polluted/dirty Drinking water	Reliable water connection	<ul style="list-style-type: none"> • Encourage and make sure that workers drink boiled water. 	Daily/weekly	Contractor and CA

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Make sure water borne diseases are not prevalent in the construction sites. • Ensure the after used water do not pollute other water resources downstream. 		
	Existence of fire hazard	Place Fire safety measures at from beginning of the construction	<ul style="list-style-type: none"> • Do not let construction workers to make open fire without proper safety in place • designate area for cooking if firewood is use, away from construction site. • Keep firefighting equipment ready and trained people on how to use prior to construction. • Education, awareness and accessibility control. • Inclusion of needs or expressions of the vulnerable groups • The burning of trashes in all forms should be avoided. 	Daily/weekly	Contractor and CA
Post-construction Phase	Improper waste management/waste generation	-Adequate number of waste bins (biodegradable and non-degradable and disposed them in designated areas. Do not burn the	<ul style="list-style-type: none"> • monthly disposal wastes in safe designated areas • SOP to give employment & income generation priority 	Once a month from DAO or extension staff	Caretaker/ management

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
		both non-bio-degradable and biodegradable wastes.	to enterprising cooperatives/farmers groups with women/youth. <ul style="list-style-type: none">• Education, awareness and accessibility control.		
	SOP non-compliance		<ul style="list-style-type: none">• Effective SOP strategy for management/business	Daily/Weekly	DOA & caretaker management
Post construction	Exposed soils, unused construction materials	<ul style="list-style-type: none">• Proper disposal of waste in designated areas• Restoration of surrounding lands with beatification and plantation activities	<ul style="list-style-type: none">• Ensure safely disposal of construction materials without compromising the health and safety of the communities	Once after completion and daily	Caretaker
Micro-irrigation					
Drip & sprinklers technologies	Inefficient water use	<ul style="list-style-type: none">• Do not overdraw water from the nearby stream. Leave 30% environment flow.• Ensure proper outlet drains from farms to prevent overflow and seepage water from the field disturbing neighbouring farms/hhs.	<ul style="list-style-type: none">• Ensure equal distribution of micro-irrigation facilities to water deficit including farmers groups (poor, youth, women).• Inclusion of needs or expressions of the vulnerable groups.	Weekly/monthly	Individual farmers, extension agents, ARDC Samtenling

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
		-Do not use chemicals & pesticides in farms where micro irrigation is used.	<ul style="list-style-type: none"> • Education, awareness and accessibility control. • Address conflict of interest in ESMP. Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 		
Rain water harvesting technologies	Water scarcity	<ul style="list-style-type: none"> • Ensure fencing of ponds with wooden poles and barbed wires to prevent accidents. • Ensure proper disposal & burning of old plastics. 	<ul style="list-style-type: none"> • Create awareness to prevent children and cattle accidents. Inclusion of needs or expressions of the vulnerable groups. • Education, awareness and accessibility control. • Address conflict of interest in ESMP. Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 	Once a month.	Individual farmers, extension agents, ARDC Samtenling
Green house technologies	Plastic waste and other metallic waste	<ul style="list-style-type: none"> • Ensure sustainability by using a mix of local and imported materials 	<ul style="list-style-type: none"> • Ensure equal distribution of greenhouse technologies to farmers group (poor, youth, women). 	Quarterly	Individual farmers, extension agents,

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIB ILITY
		<ul style="list-style-type: none"> • Ensure proper disposal & recycling of plastics and other non-biodegradable waste is highly discourage. 	<ul style="list-style-type: none"> • Education, awareness and accessibility control. • Address conflict of interest in ESMP. Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 		ARDC Samtenling.
Electric/solar fencing technologies	<p>Various models of electric fencing with less due respect for environment concerns such as excessive harvesting of trees for fencing</p> <p>Rusting of low-quality wires.</p> <p>-imited responsibility by beneficiaries</p>	<ul style="list-style-type: none"> • Electric/solar fence with galvanized wires & copper earthen plates with high quality energizer • Green live fencing of thorny plants • Collaborative group works -safe to human & animals (1-2 joules energy supplies 	<ul style="list-style-type: none"> • Ensure equal distribution of solar/electric fencing technologies to farmers group (poor, youth, women). • Inclusion of needs or expressions of the vulnerable groups. • Education, awareness and accessibility control. • Address conflict of interest in ESMP. Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 	Daily	Individual farmers, extension agents, ARDC Samtenling
Small Farm Machineries					

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
Power tillers, drum seeders & weeders	<ul style="list-style-type: none"> Poor operation & maintenance Rampant disposal of oils, lubricants, plastic& metals, noise and gaseous pollution 	<ul style="list-style-type: none"> Training on O & M plan Proper disposal of oils, lubricants, plastic& metals Reduction of noise and gaseous pollution 	<ul style="list-style-type: none"> Ensure equal distribution of farm machineries and other farm technologies to farmers group (poor, youth, women). Inclusion of needs or expressions of the vulnerable groups. Education, awareness and accessibility control. Address conflict of interest in ESMP. Maximum employment of local people. Ensure participation of women in planning, and decision making of subprojects. Provide special needs of the vulnerable groups and implement. 	Quarterly	Individual farmers, extension agents, Dzongkhags, private sectors & FMCL offices
Post-Harvest Drying Units					
Drying cardamom	Excessive harvesting of trees from the surroundings	<ul style="list-style-type: none"> Sustainable use of biomass/electrical drying ovens. Harvest trees from sustainably managed forests Encourage people to plant more fuelwood trees 	<ul style="list-style-type: none"> Ensure equal distribution of ovens to farmers group /individual (poor, youth, women). Inclusion of needs or expressions of the vulnerable groups Make sure workers donot exposed to excessive heat. 	Daily/Weekly	Individual/farmers group, NPHC, DAMC, DAO, ARDC Samtenling

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
		<ul style="list-style-type: none"> Make use of residues such as ash and charcoal in the farms. 	<ul style="list-style-type: none"> Education, awareness and accessibility control. Address conflict of interest in ESMP. Maximum employment of local people. Ensure participation of women in planning, and decision making of subprojects. Provide special needs of the vulnerable groups and implement. 		
SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
SARPANG DZONGKHAG					
Field Pack House at Ranteypani Pre-construction Phase	Land acquisition may take away private properties	Land public Clearance	Free, prior and informed consent/agreement	Once prior to construction	DAO & Engineer, Sarpang Dz; contractor Dzongkhag Environmental Officer

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
	Environment and social safeguard not included in contract documents.	Inclusion of ESMP as an integral part of contract clause.	<ul style="list-style-type: none"> • Inclusion of ESMP as an integral part of contract clause. • Inclusion of needs or expressions of the vulnerable groups • Address conflict of interest in ESMP. • Provide maximum employment of local people. • Ensure participation of women in planning, and decision making of subproject • Address special needs of the vulnerable groups and implement. • COVID-19 be included in the contract documents and be followed accordingly that includes an isolation facility in case of outbreak or to quarantine individuals coming from high-risk zones of COVID-19. • Make sure all workers, visitors and related staff 	Once during the first bidding	DAO & Engineer, Sarpang Dz; contractor

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			follow hand and respiratory hygiene and other covid protocols.		
Construction Phase	Unstable slope on the upper part and lower part of proposed CS and CPH	Construct RCC retaining wall with deep drain at its base to drained out water from interflow from upper slope.	<ul style="list-style-type: none"> • Make sure ES included in contract. • Address conflict of interest in ESMP. • Maximum employment of local people. • Ensure participation of women in planning, and decision making of subproject • Address special needs of the vulnerable groups and implement • Make sure to include detailed COVID-19 protocols in the contract documents. 	During design & during construction	DAO & Engineer, Sarpang Dz; contractor Dzongkhag Environmental Officer
	Unstable land above and below construction site	<ul style="list-style-type: none"> • Make sure the drain water goes 	<ul style="list-style-type: none"> • Consultation with engineers & contractor. • Ensure participation of women in planning, and decision making of subprojects. • Provide special needs of the vulnerable groups and implement. • Make all necessary arrangement as per national COVID-19 guidelines. 	During design & construction	DAO & Engineer, Sarpang Dz; contractor
	Draining of polluted water from PHs	Disposed water from PHs through piped systems or RCC drainage system. Treat water through	<ul style="list-style-type: none"> • Ensure that used water from PH or FPH is purified in a soaked pit and should be included in the design of PH/FPH 	Consider designing during contract work.	DAO & Engineer, Sarpang

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
		soaked pit system prior to release in natural system. Water can be treated and reused for irrigations in the nearby agriculture fields.	<ul style="list-style-type: none"> Any used water from PH or FP H not exposed workers or community to any water related hazard/diseases. Ensure participation of women in planning, and decision making of subprojects. Make sure all provisions of EA are followed. 		Dz; contractor Dzongkhag Environmental Officer
	Prevalent of dust pollution	Sprinkle water on need basis	<ul style="list-style-type: none"> Do not allow members of public to loiter around construction sites. – Use face masks by construction workers & commuters. Prevent dust related diseases to surface in the construction sites. 	Daily/weekly depending on dust level.	Contractor Dzongkhag Environmental Officer
	Haphazard stacking of construction materials	Construction materials stacked in proper enclosures	<ul style="list-style-type: none"> Do not allow members of public to loiter around construction sites. Ensure construction materials related diseases/sickness do not prevail on the construction sites. 	Daily/weekly	Contractor and CA

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Ensure participation of women in planning, and decision making of subprojects. • Address special needs of the vulnerable groups and implement. • Make sure the construction workers use face masks all times. 		
	Increase level of traffic congestion	Avoid traffic congestion	<ul style="list-style-type: none"> • Display proper safety signs. • Safety signs and should be disabled persons friendly. • Traffic congestion should not expose vulnerable groups to disadvantageous position. 	Daily/weekly	Contractor and CA
	Lack of gender sensitive toilets	Construction of attached toilets for men & women separately	<ul style="list-style-type: none"> • Place picture men & women in front of each door. • Ensure participation of women in planning, and decision making of subprojects. • Inclusion of needs or expressions of the vulnerable groups. • Address conflict of interest in ESMP. • Education, awareness, and accessibility control 	At the beginning of construction	Contractor and CA

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> Maximum employment of local people. 		
	Inadequacy in building design	<p>Strictly follow building Rules (LG/Central).</p> <p>Site beautification with flowers</p>	<ul style="list-style-type: none"> Consult locals on local traditions on construction. Education, awareness, and accessibility control. Inclusion of needs or expressions of the vulnerable groups in the ESMP for implement. Address conflict of interest in ESMP. Provide maximum employment of local people . Ensure participation of women in planning, and decision making of subprojects. Promote special needs of the vulnerable groups and implement. 	Monthly	Contractor and CA
	Not reliable Electricity connections and supply.	Connecting electric wire to construction site should be done professionally, cover the electric wire joints with proper insulating tapes	<ul style="list-style-type: none"> Make sure the electric connection will be made available to all workers during construction for various purposes. Deployment of gender sensitive appliances. 	Daily/weekly	Contractor and CA

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Education, awareness, and accessibility control. • Inclusion of needs or expressions of the vulnerable groups 		
	Polluted/dirty Drinking water	Reliable water connection	<ul style="list-style-type: none"> • Encourage and make sure that workers drink boiled water. • Make sure water borne diseases are not prevalent in the construction sites. • Ensure the after used water do not pollute other water resources downstream. 	Daily/weekly	Contractor and CA
	Existence of fire hazard	Place Fire safety measures at from beginning of the construction	<ul style="list-style-type: none"> • Do not let construction workers to make open fire without proper safety in place • designate area for cooking if firewood is use, away from construction site. • Keep firefighting equipment ready and trained people on how to use prior to construction. • Education, awareness and accessibility control. 	Daily/weekly	Contractor and CA

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Inclusion of needs or expressions of the vulnerable groups • The burning of trashes in all forms should be avoided. 		
Post-construction Phase	Improper waste management/waste generation	-Adequate number of waste bins (biodegradable and non-degradable and disposed them in designated areas. Do not burn the both non-bio-degradable and biodegradable wastes.	<ul style="list-style-type: none"> • monthly disposal wastes in safe designated areas • SOP to give employment & income generation priority to enterprising cooperatives/farmers groups with women/youth. • Education, awareness and accessibility control. 	Once a month from DAO or extension staff	Caretaker/ management
	SOP non-compliance		<ul style="list-style-type: none"> • Effective SOP strategy for management/business 	Daily/Weekly	DOA & caretaker management
Post construction	Exposed soils, unused construction materials	<ul style="list-style-type: none"> • Proper disposal of waste in designated areas • Restoration of surrounding lands with beatification and plantation activities 	<ul style="list-style-type: none"> • Ensure safely disposal of construction materials without compromising the health and safety of the communities 	Once after completion and daily	Caretaker
Micro-irrigation					

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
Drip & sprinklers technologies	Inefficient water use	<ul style="list-style-type: none"> Do not overdraw water from the nearby stream. Leave 30% environment flow. Ensure proper outlet drains from farms to prevent overflow and seepage water from the field disturbing neighbouring farms/hhs. <p>-Do not use chemicals & pesticides in farms where micro irrigation is used.</p>	<ul style="list-style-type: none"> Ensure equal distribution of micro-irrigation facilities to water deficit including farmers groups (poor, youth, women). Inclusion of needs or expressions of the vulnerable groups. Education, awareness and accessibility control. Address conflict of interest in ESMP. Maximum employment of local people. Ensure participation of women in planning, and decision making of subprojects. Promote special needs of the vulnerable groups and implement. 	Weekly/monthly	Individual farmers, extension agents, ARDC Samtenling
Rain water harvesting technologies	Water scarcity	<ul style="list-style-type: none"> Ensure fencing of ponds with wooden poles and barbed wires to prevent accidents. Ensure proper disposal & burning of old plastics. 	<ul style="list-style-type: none"> Create awareness to prevent children and cattle accidents. Inclusion of needs or expressions of the vulnerable groups. Education, awareness and accessibility control. Address conflict of interest in ESMP. Maximum employment of local people. 	Once a month.	Individual farmers, extension agents, ARDC Samtenling

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 		
Green house technologies	Plastic waste and other metallic waste	<ul style="list-style-type: none"> • Ensure sustainability by using a mix of local and imported materials • Ensure proper disposal & recycling of plastics and other non-biodegradable waste is highly discourage. 	<ul style="list-style-type: none"> • Ensure equal distribution of greenhouse technologies to farmers group (poor, youth, women). • Education, awareness and accessibility control. • Address conflict of interest in ESMP. Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 	Quarterly	Individual farmers, extension agents, ARDC Samtenling.
Electric/solar fencing technologies	Various models of electric fencing with less due respect for environment concerns such as excessive harvesting of trees for fencing	<ul style="list-style-type: none"> • Electric/solar fence with galvanized wires & copper earthen plates with high quality energizer • Green live fencing of thorny plants 	<ul style="list-style-type: none"> • Ensure equal distribution of solar/electric fencing technologies to farmers group (poor, youth, women). • Inclusion of needs or expressions of the vulnerable groups. • Education, awareness and accessibility control. • Address conflict of interest in ESMP. 	Daily	Individual farmers, extension agents, ARDC Samtenling

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
	poles.-Rusting of low-quality wires. -limited responsibility by beneficiaries	<ul style="list-style-type: none"> • Collaborative group works - safe to human & animals (1-2 joules energy supplies 	<p>Maximum employment of local people.</p> <ul style="list-style-type: none"> • Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 		
Small Farm Machineries					
Power tillers, drum seeders & weeders	<ul style="list-style-type: none"> • Poor operation & maintenance • Rampant disposal of oils, lubricants, plastic& metals, noise and gaseous pollution 	<ul style="list-style-type: none"> • Training on O & M plan • Proper disposal of oils, lubricants, plastic& metals • Reduction of noise and gaseous pollution 	<ul style="list-style-type: none"> • Ensure equal distribution of farm machineries and other farm technologies to farmers group (poor, youth, women). • Inclusion of needs or expressions of the vulnerable groups. • Education, awareness, and accessibility control. • Address conflict of interest in ESMP. Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. • Provide special needs of the vulnerable groups and implement. 	Quarterly	Individual farmers, extension agents, Dzongkhags, private sectors & FMCL offices
Post-Harvest Drying Units					

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
Drying cardamom	Excessive harvesting of trees from the surroundings	<ul style="list-style-type: none"> • Sustainable use of biomass/electrical drying ovens. • Harvest trees from sustainably managed forests • Encourage people to plant more fuelwood trees • Make use of residues such as ash and charcoal in the farms. 	<ul style="list-style-type: none"> • Ensure equal distribution of ovens to farmers group /individual (poor, youth, women). • Inclusion of needs or expressions of the vulnerable groups • Make sure workers do not exposed to excessive heat. • Education, awareness and accessibility control. • Address conflict of interest in ESMP. • Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. • Provide special needs of the vulnerable groups and implement. 	Daily/Weekly	Individual/f armers group, NPHC, DAMC, DAO, ARDC Samtenling
SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
CHUKHA DZONGKHAG					

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
Roadside market shed at Ramitey Pre-construction Phase	Land acquisition may take away private properties	Land public Clearance	Free, prior and informed consent/agreement	Once prior to construction	DAO & Engineer, Chukha Dz; contractor Dzongkhag Environmental Officer
	Environment and social safeguard not included in contract documents.	Inclusion of ESMP as an integral part of contract clause.	<ul style="list-style-type: none"> • Inclusion of ESMP as an integral part of contract clause. • Inclusion of needs or expressions of the vulnerable groups • Address conflict of interest in ESMP. • Provide maximum employment of local people. • Ensure participation of women in planning, and decision making of subproject • Address special needs of the vulnerable groups and implement. • COVID-19 be included in the contract documents and be 	Once during the first bidding	DAO & Engineer, Chukha Dz; contractor

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<p>followed accordingly that includes an isolation facility in case of outbreak or to quarantine individuals coming from high-risk zones of COVID-19.</p> <ul style="list-style-type: none"> Make sure all workers, visitors and related staff follow hand and respiratory hygiene and other covid protocols. 		
Construction Phase	Unstable slope on the upper part and lower part of proposed CS and CPH	Construct RCC retaining wall with deep drain at its base to drained out water from interflow from upper slope.	<ul style="list-style-type: none"> Make sure ES included in contract. Address conflict of interest in ESMP. Maximum employment of local people. Ensure participation of women in planning, and decision making of subproject Address special needs of the vulnerable groups and implement Make sure to include detailed COVID-19 protocols in the contract documents. 	During design & during construction	DAO & Engineer, Chukha Dz; contractor Dzongkhag Environmental Officer
	Unstable land above and below construction site	<ul style="list-style-type: none"> Make sure the drain water goes 	<ul style="list-style-type: none"> Consultation with engineers & contractor. Ensure participation of women in planning, and decision making of subprojects. 	During design & construction	DAO & Engineer, Chukha Dz; contractor

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Provide special needs of the vulnerable groups and implement. • Make all necessary arrangement as per national COVID-19 guidelines. 		
	Draining of polluted water from PHs	Disposed water from PHs through piped systems or RCC drainage system. Treat water through soaked pit system prior to release in natural system. Water can be treated and reused for irrigations in the nearby agriculture fields.	<ul style="list-style-type: none"> • Ensure that used water from PH or FPH is purified in a soaked pit and should be included in the design of PH/FPH • Any used water from PH or FP H not exposed workers or community to any water related hazard/diseases. • Ensure participation of women in planning, and decision making of subprojects. • Make sure all provisions of EA are followed. 	Consider designing during contract work.	DAO & Engineer, Chukha Dz; contractor Dzongkhag Environmental Officer
	Prevalent of dust pollution	Sprinkle water on need basis	<ul style="list-style-type: none"> • Do not allow members of public to loiter around construction sites. – • Use face masks by construction workers & commuters. • Prevent dust related diseases to surface in the construction sites. 	Daily/weekly depending on dust level.	Contractor Dzongkhag Environmental Officer

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
	Haphazard stacking of construction materials	Construction materials stacked in proper enclosures	<ul style="list-style-type: none"> Do not allow members of public to loiter around construction sites. Ensure construction materials related diseases/sickness do not prevail on the construction sites. Ensure participation of women in planning, and decision making of subprojects. Address special needs of the vulnerable groups and implement. Make sure the construction workers use face masks all times. 	Daily/weekly	Contractor and CA
	Increase level of traffic congestion	Avoid traffic congestion	<ul style="list-style-type: none"> Display proper safety signs. Safety signs and should be disabled persons friendly. Traffic congestion should not expose vulnerable groups to disadvantageous position. 	Daily/weekly	Contractor and CA
	Lack of gender sensitive toilets	Construction of attached toilets for men & women separately	<ul style="list-style-type: none"> Place picture men & women in front of each door. Ensure participation of women in planning, and decision making of subprojects. 	At the beginning of construction	Contractor and CA

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Inclusion of needs or expressions of the vulnerable groups. • Address conflict of interest in ESMP. • Education, awareness, and accessibility control • Maximum employment of local people. 		
	Inadequacy in building design	<p>Strictly follow building Rules (LG/Central).</p> <p>Site beautification with flowers</p>	<ul style="list-style-type: none"> • Consult locals on local traditions on construction. • Education, awareness, and accessibility control. • Inclusion of needs or expressions of the vulnerable groups in the ESMP for implement. • Address conflict of interest in ESMP. • Provide maximum employment of local people • . Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 	Monthly	Contractor and CA

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
	Not reliable Electricity connections and supply.	Connecting electric wire to construction site should be done professionally, cover the electric wire joints with proper insulating tapes	<ul style="list-style-type: none"> • Make sure the electric connection will be made available to all workers during construction for various purposes. • Deployment of gender sensitive appliances. • Education, awareness, and accessibility control. • Inclusion of needs or expressions of the vulnerable groups 	Daily/weekly	Contractor and CA
	Polluted/dirty Drinking water	Reliable water connection	<ul style="list-style-type: none"> • Encourage and make sure that workers drink boiled water. • Make sure water borne diseases are not prevalent in the construction sites. • Ensure the after used water do not pollute other water resources downstream. 	Daily/weekly	Contractor and CA
	Existence of fire hazard	Place Fire safety measures at from beginning of the construction	<ul style="list-style-type: none"> • Do not let construction workers to make open fire without proper safety in place • designate area for cooking if firewood is use, away from construction site. 	Daily/weekly	Contractor and CA

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Keep firefighting equipment ready and trained people on how to use prior to construction. • Education, awareness, and accessibility control. • Inclusion of needs or expressions of the vulnerable groups • The burning of trashes in all forms should be avoided. 		
Post-construction Phase	Improper waste management/waste generation	-Adequate number of waste bins (biodegradable and non-degradable and disposed them in designated areas. Do not burn the both non-bio-degradable and biodegradable wastes.	<ul style="list-style-type: none"> • monthly disposal wastes in safe designated areas • SOP to give employment & income generation priority to enterprising cooperatives/farmers groups with women/youth. • Education, awareness and accessibility control. 	Once a month from DAO or extension staff	Caretaker/ management
	SOP non-compliance		<ul style="list-style-type: none"> • Effective SOP strategy for management/business 	Daily/Weekly	DOA & caretaker management

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
Post construction	Exposed soils, unused construction materials	<ul style="list-style-type: none"> • Proper disposal of waste in designated areas • Restoration of surrounding lands with beatification and plantation activities 	<ul style="list-style-type: none"> • Ensure safely disposal of construction materials without compromising the health and safety of the communities 	Once after completion and daily	Caretaker
Micro-irrigation					
Drip & sprinklers technologies	Inefficient water use	<ul style="list-style-type: none"> • Do not overdraw water from the nearby stream. Leave 30% environment flow. • Ensure proper outlet drains from farms to prevent overflow and seepage water from the field disturbing neighbouring farms/hhs. <p>-Do not use chemicals & pesticides in farms where micro irrigation is used.</p>	<ul style="list-style-type: none"> • Ensure equal distribution of micro-irrigation facilities to water deficit including farmers groups (poor, youth, women). • Inclusion of needs or expressions of the vulnerable groups. • Education, awareness and accessibility control. • Address conflict of interest in ESMP. Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 	Weekly/monthly	Individual farmers, extension agents, NOAC Yusipang
Rain water harvesting technologies	Water scarcity	<ul style="list-style-type: none"> • Ensure fencing of ponds with wooden poles and 	<ul style="list-style-type: none"> • Create awareness to prevent children and cattle accidents. 	Once a month.	Individual farmers, extension

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
		barbed wires to prevent accidents. <ul style="list-style-type: none"> Ensure proper disposal & burning of old plastics. 	Inclusion of needs or expressions of the vulnerable groups. <ul style="list-style-type: none"> Education, awareness, and accessibility control. Address conflict of interest in ESMP. Maximum employment of local people. Ensure participation of women in planning, and decision making of subprojects. Promote special needs of the vulnerable groups and implement. 		agents, NOAC Yusipang
Green house technologies	Plastic waste and other metallic waste	<ul style="list-style-type: none"> Ensure sustainability by using a mix of local and imported materials Ensure proper disposal & recycling of plastics and other non-biodegradable waste is highly discourage. 	<ul style="list-style-type: none"> Ensure equal distribution of greenhouse technologies to farmers group (poor, youth, women). Education, awareness and accessibility control. Address conflict of interest in ESMP. Maximum employment of local people. Ensure participation of women in planning, and decision making of subprojects. Promote special needs of the vulnerable groups and implement. 	Quarterly	Individual farmers, extension agents, NOAC Yusipang.

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
Electric/solar fencing technologies	<p>Various models of electric fencing with less due respect for environment concerns such as excessive harvesting of trees for fencing poles.</p> <p>-Rusting of low-quality wires.</p> <p>-limited responsibility by beneficiaries</p>	<ul style="list-style-type: none"> • Electric/solar fence with galvanized wires & copper earthen plates with high quality energizer • Green live fencing of thorny plants • Collaborative group works -safe to human & animals (1-2 joules energy supplies 	<ul style="list-style-type: none"> • Ensure equal distribution of solar/electric fencing technologies to farmers group (poor, youth, women). • Inclusion of needs or expressions of the vulnerable groups. • Education, awareness, and accessibility control. • Address conflict of interest in ESMP. Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. • Promote special needs of the vulnerable groups and implement. 	Daily	Individual farmers, extension agents, NOAC Yusipang
Small Farm Machineries					
Power tillers, drum seeders & weeders	<ul style="list-style-type: none"> • Poor operation & maintenance • Rampant disposal of oils, lubricants, plastic& metals, noise and gaseous pollution 	<ul style="list-style-type: none"> • Training on O & M plan • Proper disposal of oils, lubricants, plastic& metals • Reduction of noise and gaseous pollution 	<ul style="list-style-type: none"> • Ensure equal distribution of farm machineries and other farm technologies to farmers group (poor, youth, women). • Inclusion of needs or expressions of the vulnerable groups. • Education, awareness, and accessibility control. • Address conflict of interest in ESMP. Maximum employment of local people. 	Quarterly	Individual farmers, extension agents, Dzongkhags, private sectors & FMCL offices

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> • Ensure participation of women in planning, and decision making of subprojects. • Provide special needs of the vulnerable groups and implement. 		
Post-harvest drying units					
Drying cardamom	Excessive harvesting of trees from the surroundings	<ul style="list-style-type: none"> • Sustainable use of biomass/electrical drying ovens. • Harvest trees from sustainably managed forests • Encourage people to plant more fuelwood trees • Make use of residues such as ash and charcoal in the farms. 	<ul style="list-style-type: none"> • Ensure equal distribution of ovens to farmers group /individual (poor, youth, women). • Inclusion of needs or expressions of the vulnerable groups • Make sure workers do not exposed to excessive heat. • Education, awareness and accessibility control. • Address conflict of interest in ESMP. • Maximum employment of local people. • Ensure participation of women in planning, and decision making of subprojects. 	Daily/Weekly	Individual/f armers group, NPHC, DAMC, DAO, NOAC Yusipang

SUB-PROJECT /ACTIVITY	ENVIRONMENT& SOCIAL ISSUE(S)	ENVIRONMENTAL CODE OF PRACTICE	SOCIAL CODE OF PRACTICE	MONITORING PLAN (TIMING/ FREQUENCY)	RESPONSIBILITY
			<ul style="list-style-type: none"> Provide special needs of the vulnerable groups and implement. 		

6. IMPLEMENTATION ARRANGEMENTS, MONITORING, AND CAPACITY BUILDING

The project is being implemented by the Department of Agriculture by establishing an independent Project Management Unit (PMU) within the DoA, MoAF and is responsible for foreseeing the implementation and monitoring of the ESMF.

The National Environment Commission Secretariat (NECS) is the apex institution for issuance of the EC to all developmental activities/projects within the Kingdom. The mandated ESIA/IESE and the EC also take into consideration all the social issues.

Every Dzongkhag has Dzongkhag Environment Committee (DEC) which is also a designated Competent Authority (CA) to issue EC. In case of the FSAPP project activities, except for irrigation subproject activity, where DoA was designated as CA, other activities requiring EC could be cleared by the respective DEC. With regards to ESS/IESE and EC processing the followings arrangement were being implemented.

6.1 Department of Agriculture-Project Management Unit (DoA PMU) and Beneficiary Gewog

Beneficiary Gewog of a subproject activity with technical support from the Geog/Dzongkhag RNR Sector and the PMU shall be responsible for undertaking the screening, scoping (including the formulation of draft ToR), baseline data collection, conducting ESS/ESIA/IESE, and preparing the management plans, including the ESMP.

6.2 Dzongkhag Environmental Committee (DEC)

If the activities are not within the jurisdiction of DEC it will review the ESIA/IESE report for its completeness in terms of documentation and forward the report to the relevant CA with its comments/observations and recommendations. If the activity is within the competency of the DEC, the DEC will first review and approve the ToR for the ESIA/IESE exercise. On receipt of the appropriate report, the DEC will review and scrutinize the information provided in the report and ask for additional information, if required. When the information is complete and satisfactory, DEC issue the EC with a set of Terms and Conditions. The proposal/application also can be rejected if the information is incomplete, not satisfactory or if irreversible impacts are foreseen. When there is no designated CA, the DEC will forward the ToR/report to the NECS.

6.3 Competent Authority (CA)

When the ToR and the ESIA/IESE report are forwarded to the relevant CA by the DEC, the CA will exercise the same procedure as mentioned above for the DEC.

6.4 National Environment Commission (NECS)

When the cases are referred by the CAs to the NECS, the NECS will assume the role of CA to review, scrutinize and make decisions to issue EC or reject the proposal/application.

6.5 Monitoring and Capacity Building

The ESMF requires regular supervision and monitoring of the impact of the project on the environment and social aspects. The project through PMU is expected to plan and implement the following environmental monitoring programs to ensure environmental and social sustainability of livelihood programs: (i) compliance monitoring; (ii) quarterly progress monitoring; and (iii) hiring of third party for environmental review/audit. The arrangements for supervision and monitoring include appointment/designating of an Environment and Social Focal Points at the PMU and vesting all the environment and social safeguards supervision and regular monitoring requirements at respective sites. Dzongkhag Environmental Officer shall carry out periodical compliance monitoring. The NECS officials are expected to conduct surveillance through ad-hoc/surprise visits to construction sites.

The Project implementing team (PMU, Dzongkhags and Geog agriculture officers, Dzongkhag and Gewog engineers, and ARDC engineers) must have awareness, sensitization, and necessary skill regarding environmental and social aspects of the project for necessary sub-project planning and implementation. For sustainability of the project benefits, implementation smoothness of the environmental principles, and social safeguards, the implementers need adequate capacity building to orient project implementers (e.g PMU officials, ARDC, Dzongkhags, and Gewogs) officials to integrate sound environmental and social management into the sub-projects. An estimated budget for the training of staff members is shown in Table 12 and overall budget for this ESMP is provided in Table 13. A total of BTN25.11 million is estimated to finance the overall ESMP including hiring of consultants for about 180 days, this cost also includes training of DAO staffs in ESMP activities. The contingency is estimated at approximately BTN.2.5 million (10 percent on grand total), that will add up to BTN 27.61 million.

Table 12 (A). Proposed Budget for Capacity Building of ESMF based on the estimated costs for the training It includes the costs for hiring the environmental and social experts (trainers), costs for hiring training halls, costs for training materials, and daily subsistence allowances to the trainees.					
Training Type	Training duration for each batch (Days)	Total training duration for all batches (Days)	No. of participant	Indicative unit costs in BTN	Total Costs in BTN
The hiring of trainers (environmental and social experts – 2 persons)	The total duration of 22 days for each including travel time to the Dzongkhags			BTN 10,000 per day for each	440,000
Training materials				50,000.00	50,000.00
Logistical support (training halls and travel)				15,000.00	170,000.00
Orientation to ESMF	0.5	3	93	8,000.00	744000.00
Preparation of EIA and ESMP	0.5	3	93		
Environmental clearance procedure	0.5	3	93		
ESMP Implementation	0.5	3	93		

Total(A)	1,404,000.00
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Table 13 (B) Estimated cost to implement ESMP in FSAPP activities under additional financing of GAFSP, refer to Tables. The unit costs are averaged from all sites.						
Sub activities	Identified ES	Task	Quantity	Unit costs (NU)	Total costs (NU)	Remarks
Pre-construction	Site assessment /feasibilities	Travel and assessment by PMU, PIUs and central agencies staff	9 sites x 5-person x 10 days =450 units	3000	1,350,000.00	Unit cost also includes transportation cost.
	Preparing ESMP	Data collection and analysis by staff as well as consultant	9 sites x 9 persons x 3 days =243	3000	729,000.00	
During construction	Health and Safety including COVID-19	Awareness, materials, and facilities	9 sites x 12 months =108	10000.00	1,080,000.00	
	Creation of healthy living spaces for workers including electricity and water connections and stores for materials storing	Construction of Living spaces for workers including covid isolation units.	9 sites x 10 days x 5 persons =450 +Nu200,000 per sites X9	1500.00 X 450+200,000 x9	2,475,000.00	This will be part of civil works.
	Toilets	Construction of gender sensitive toilets	9 x 5 days +material costs			
	Implementations of environmental code of practises (waste	Soil excavations and transportations	9 sites x 5 days x 5 persons	2500.00	225,000.00	Average cost

	disposal, topsoils and other materials, proper drainage)					
	Social awareness and training		4 times a year x 2 persons x 9 sites + posters	2000.00 +2000 x9	126,000.00	
	Dust and noise suppression		9 x 30 x12=3240	500.00	1,620,000.00	
	ESMP plan preparation	Hiring of consultants	180 days	18,000.00	3,240,000.00	
After constructio n	Cleaning and beautification	Landscaping	9 x 5 days 5 persons	1000.00	225,000.00	
Total (B)					11,070,000.00	
Grand Total (Table 12 (A)+Table 13 (B))					25,110,000.00	
Contingenc y				10 percent of grand total	2,511,000.00	

ANNEX 1

FIELD VISIT REPORTS OF SIBJITHANG, SANGBAY AMA, EUSU AND DAGAPELA INFRASTRUCTURE SITES

CENTRALIZED PACK HOUSE - SIBJITHANG

General Description

The proposed site lies along the alluvial fan of Amochu river basin and drained by one of its small tributaries. The site lies within government land. The site belongs to sub-tropical agroecological zones and content many tree species such as *Acrocarpus fraxinifolius*, *Ailanthus grandis*, *Bombax ceiba*, *Crateva religiosa*, *Daubanga grandiflora*, *Musa sikkimensis*, *Pterospermum acerifolium*, *Cinnamomum spp*, *Quercus indica*, *Calicarpa arborensence*, *Ficus spp*, among others in its imediate surroundings, however, the site identified for construction donot have trees, it is covered by *Artemisia spp* (See Figures 1 and 2). The site lies at an elevation of 800 meter aove sea-level. Since it lies in sub-tropical region of the country the rainfall during rainy season could be very high upto 4000 mm and higher temperature in summer season. The high intensity rain occasionally creates flush floods.



Fig 1. The Yellow Pin marks the site

The area selected for the Pack-House is within the premise of Dungkhag Administration of Sombaykha. It is very close to secondary Samtse-Haa Highway. Since the area is within the premise of Sombaykha Dungkhag Administration, the clearances for the construction of Pack-House will not be a problem. The site's central location amongst the scattered villages and nearness to highway makes it ideal for the marketing of agricultural products from the region. The region can supply agricultural products to other

regions, such as Phuntsholing, Samtse, Haa, and other major townships of western Bhutan in a consistent manner. However, a proper standard operating procedure (SOP) of the Pack-House is needed as it involves many villages and many villagers do not having a common understanding on different issues.



Fig 2: Closed-up view of proposed construction site for Pack-House

Geology and Soils of the Sombaykha Region

According to available literature , generally the site falls under Greater Himalayan Zone(Tobgay, 2012) the area geologically the entire region falls under Orthogneiss unit also known as (Cambrian-Ordovician) origin characterized by cliff-forming, massive-weathering, granite-composition of orthogneiss(a granitic type rock rich in plagioclase and feldspar; generally, exhibits leucosomes and abundant feldspar augen (Long and McQuarrie, 2010; Long et al., 2011). Paragneiss, schist, and quartzite intervals locally split out. Interpreted as deformed Cambrian-Ordovician granite plutons that intruded Greater Himalayan sedimentary protoliths (Long and McQuarrie, 2010). The soils in the area were found to be mostly sandy, the entire Dungkhag area was formed by different geological processes such as fluvial, flood, collapse, and outwash deposits, which essentially is highly unstable as the landscape formed with such processes are composed of rock-soils aggregates.

Regarding infrastructure development in the area, careful plan with proper protecting infrastructure should be planned and implemented to protect the infrastructure from floods, landslides and erosions which could pose major risks in future. The sites are shown on Figs 3 and 4.



Fig 3: Google Map location of proposed Centralized Pack House at Sibjithang.

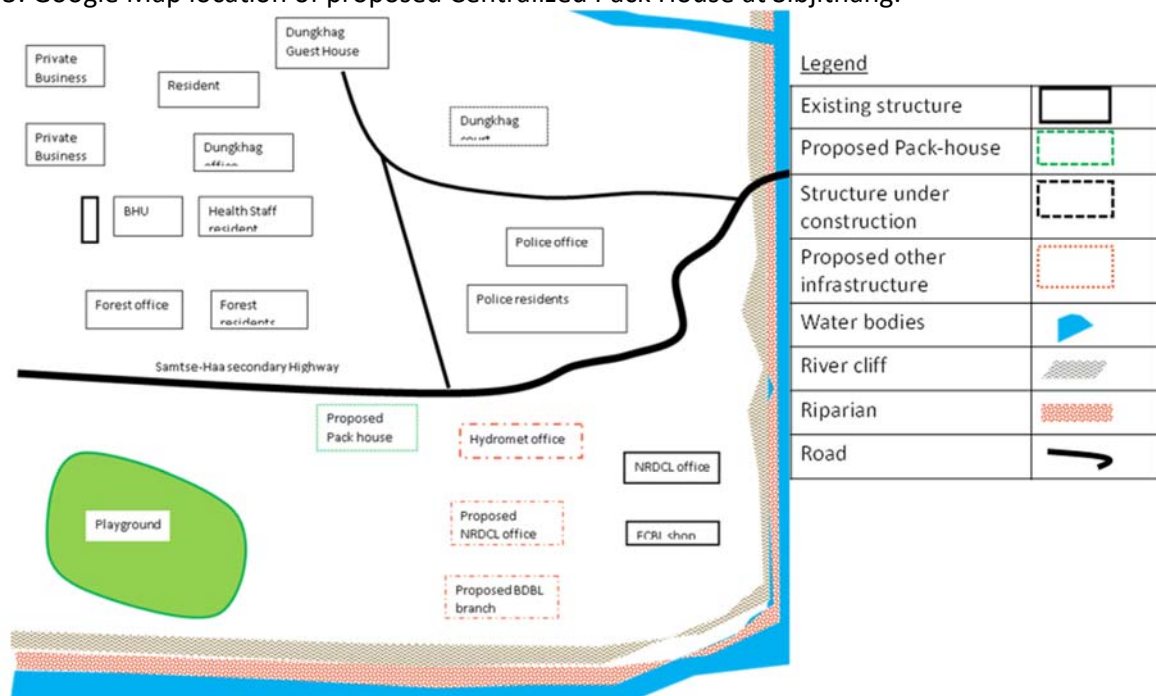


Fig 4: Hand drawn (not scaled) map of site selected for construction of Pack-House.

Conclusion

The proposed Pack-House site at Sombaykha (Sibjithang) is ideal for its location being near to highway and central point for all scattered population, moreover, the proposed site falls under government land, which means there are no hassle in getting the clearance for the intend purpose. The site is a vacant land with no

known human settlement. It could be constructed comparatively with less finance as raw materials such as sand and stones are readily available from the area locally. However, the site falls under fragile geological conditions, it is exposed to flooding from rivers/streams, and erosions. The fully operationalization of the Pack-House must be accompanied by SOPs for its sustainability. It is also vital to construct proper drainage system to avoid erosion from the steep slope along the Amochu river cliff (See Fig 4).

FIELD PACK HOUSE – SANGBAY AMA

General Description

The site falls under warm-temperate agroecological zone with tree species being *Alangium chiensis*, *Altingia excelsa*, *Bichofia javanica*, *Callicarpa arborea*, *Castanopsis indica*, *Cordia obliqua*, *Dendrocalamus hookeri* (bamboo), *Ostodes paniculata*, *Schima wallichii*, *Macaranga spp.*, *Musseanda roxburghii*, *Rattan spp*, among others. Generally this region is a transition zone between sub-tropical and temperate region and will be moist and foggy in most days in an year. The area lies at 1800 meter above sea-level.

The area selected for the Pack-House is within the RNR Center which is just below the Gup’s office and has an area of over 50 decimals. Since the land ownership is with RNR Sector of Haa Dzongkhag, obtaining clearance for construction of field Pack-House will be relatively easy. There are no exiting trees and area was black topped(sealed) for some reason in the past (see Figs 5 and 6).

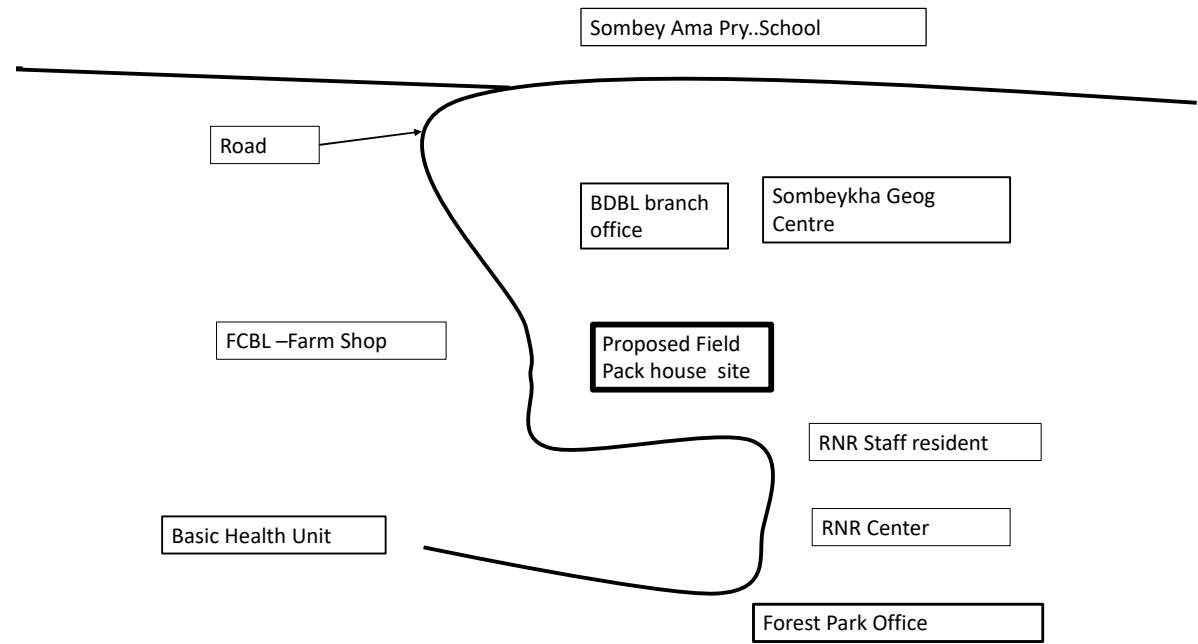




Fig 5: The sketch map of proposed site for construction of field Pack-House at Sangbay Ama

The area is ideal for Pack-House and site developmental activities such as construction of retaining wall between gup's office and below the proposed site will be ideal for permanent structure. Other environmental and social parameters are within the acceptable ranges.

Social Descriptions of the Locality of Pack-House

Demographic data and household (Table 1) information for the Sangbay Geog was obtained from the Agriculture Extension Officer of Sangbaykha geog. The proposed field Pack-House is expected to cater to the needs of six scattered villages of the gewog (Table 1) Most of the people are engaged in mixed agriculture and only few crops are grown commercially cultivated (cardamom and potato). Commercially producing vegetables seems feasible as indicated in BTOR report of previous study. The Pack-House is expected to cater to the needs for 99 households of six villages (Table 1). It is interesting to note that these two villages have the maximum number of people and have more female per household than male counterparts.

Table 1: The demographic data of Sangbay gewog				
Village	No.of HHs	Male	Female	Disabled
Ama	17	151	207	2
Hajjona	4	NA	NA	NA
Gyeldrakha	12	NA	NA	NA
Nakikha	27	NA	NA	NA
Nakha	27	73	98	non

Nebji	4	NA	NA	NA
Tsanglina	8	NA	NA	NA
Total	99			

As indicated in the previous report, there are few cash crops grown commercially, however “most of the villages are within four to five hours drive from Haa and Samtse. During the spring season Haa is the ideal market for cole crops and green leafy vegetables as the upper valley of Haa would have just started cultivating these vegetables. In the summer months Samtse could be the best alternative in terms of beans, cole crops and radish. This is the time when the southern part of the country would not be growing many vegetables due to heavy rain and hot weather.

As cardamom is the major cash crop it used to be transported on horse-back till Samtse. Today with a decline in the price of cardamom and lack of market, it is transported to Phuentsholing and sold to Food Corporation of Bhutan (FCB) at the price set by the Government under the buyback scheme”.

Since all the villages are connected by farm road, access to market is not a big concern for the farmers of this geog. However as in the previous case, the SOP for its sustenance will be paramount, as it involves large number of people from six different villages, who may have differing opinion on same issues.

Summary of Field Pack-House at Sangbay Ama

All the parameters of environmental and social for development/construction of field Pack-House at Sangbay Ama are well within acceptable ranges of the funding agency, such infrastructure could be developed by constructing mitigations measures for some environmental concerns such as construction of retaining wall above and below the facility to avoid risk of erosion and land slide. Importantly the drainage system to drain out water the Pack-House should also be prioritized and developed, the excess water/water coming out after washing the vegetables could be connected to irrigation canals as there are agricultural fields below the proposed site. The residues from the Pack-House could partly be given to cattle owners and rest could be decomposed into compost.

Proposed Field Pack-House at Eusu Gewog Centre

Environmental Descriptions of Eusu Pack-House Site

The identified site for the construction of a proper Field Pack-House is within the Gewog Centre and the land belongs to the Agriculture Sector of the Haa Dzongkhag, like in other sites land acquisition for the intended purpose will not be a barrier. The site falls under cold temperate region and is at an elevation of over 2600 masl. The site annual average temperature is 5.7 °C and annual rainfall of over 3000 mm. The main vegetation of the region are mostly conifer species, the proposed site is surround by blue pine forest. Eusu Gewog Centre is located 5 kms away from the Dzongkhag and proposed site is about 50 meters below the main highway that connects Haa to rest of the country.



Figure 7: Identified site for field pack house below the Eusu Gewog Office, the arrow shows the location of the proposed site.



Figure 8. Location of the site

Social Descriptions of the proposed Pack-House at EUSU Geog

Eusu Gewog has 5 Chiwogs and 11 villages with 255 households. The total population was 1907 as per the present statistics of the Gewog. The farmers grow potato as the major cash crop followed by turnip and radish. Turnip is not a major crop for the market, but its leaves are used as main ingredient for the local delicacy known as “***Haapai Hoenthay***”. Other crops grown in the region are wheat, buckwheat, barley and quinoa. There is a potential for proper drying and marketing of turnip leaves for commercial production of ***Haapai Hoenthay***.

The proposed site is ideal for Pack-House as it is centrally located, close to national highway and serves villages far away from the town as well as those near the town. Since all the social and environmental parameters are within the premise of acceptance of the funding agency.

COLD STORAGE AND CENTRAL PACKHOUSE AT DAGANA DZONGKHAG

The Dzongkhag had identified the site under NPH-SC for the construction of a Pack-House (PH) and the renovation of the existing zero energy cold store into a proper cold storage facility (See Fig 9 and 10). The NPH-SC is in Dagapela under Gozhi gewog. Though the selected site is in Gozhi gewog, the Pack-House is meant for people of Kana, Geserling, Tsendengang and Khebisa and Gozhi geogs. For the population of these gewogs Dagapela used to be their commercial hub. The proposed site at Dagapela is an ideal place for historical and marketing strategic reasons. Moreover, the proposed site for PH is very close to Lamoizhingkha-Dagana highway, the products after processing could easily be sold out from FSO which was completed from FSAPP funding and is already being used by FCBL as farm shop to cater to the needs of population under Covid-19 pandemic restrictions. There is enough space within the compound of the existing NPH-SC and the zero-energy cold store. The identified site is NPH-SC and to the left side (if you face up the slope from NPH-SC) of the cold store. As the ownership of the area is within the Ministry of Agriculture and Forests (MoAF), it would be easier to get the land acquisition to set up the Pack-House and existing zero-energy cold storage could be renovated to a full-fledged cold storage facility.



Fig 9: The site proposed for construction of Pack-House (PH) as indicated as PH site is close by Lamoizhingkha -Dagana highway

Environmental Descriptions of the proposed Pack-House at Dagapela

The area falls under warm temperate zone and the main plant species are similar to those of Sangbay geog of Haa. The Dagana region gets relatively lesser rainfall as it falls towards rain shadow area. The proposed site has well developed clayey soils and rocks found in those regions are dominantly amphibolite facies (Gansser, 1983), kyanite, sillimanite or staurolite paragneiss, schist and quartzite, greenschist quartzite and biotite-muscovite-garnet schist (Long and McQuarrie, 2010) are some of the rock types in the region. There is no imminent hazard or any environmental risks on the proposed PH site during or after construction. All environmental concerns/issues are prior to during and after constructions are within the acceptable ranges of the funding agencies. As mentioned in Fig.9, there is a small area fenced to recharge the dried-up lakes, with proper treatment of water after use in PH, it could safely be used for filling the lake. For all sites, the water after use in Pack-Houses may be filtered in soak pits and release into natural systems or

reuse for different purposes. The residues from the vegetables after processing and cleaning could be decomposed into organic compost and could also be supplied to nearby community as animal feeds. For all construction projects there are dust issues in dry seasons and localized soil erosions during rainy seasons (paradox of construction”). Therefore, proper mitigations such as spraying water during dry seasons and may be covering the excavated surfaces by plastic during the rainy season may mitigate such effect.



Fig.10: Zero-energy cold store nearby NPH-SC built with funding support from the SAARC Development Fund. The structure has not been utilized efficiently till date, can be renovated as full-scale cold storage.

Social Descriptions of the Site

Socially all the productions and marketing parameters (agriculture land, access road and connectivity to larger market) for the Pack-House and FSO are very conducive. The main crops grown in the areas are Mandarin orange, cardamom, potato, maize, and paddy along with several crops and vegetables. Recently the Dzongkhag is also emphasizing on productions of vegetables on commercial scales. As mentioned earlier Dagapela township was historically a commercial hub for people of many geogs of Dagana Dzongkhag. With the new developmental activities such as construction of new highway connecting Dagana with Lamoizhingkha in the south would bring in lot of opportunities for farm products from the region. However, every successful venture must be framed within the social norms and standard otherwise it may not be sustainable for future. Therefore, framing SOP for proper functioning of the of the facilities is paramount. According to PD of National Post Harvest Center (NPHC), the facilities will technically be supported by NPHC, however, rules and regulations pertaining to its daily uses and cost sharing mechanism during its operation must be framed and known to each stakeholder.

THE SITE MAPS OF PLANNED CENTRALIZED PACK HOUSE AT YOELTSE (FIGURE 11), COLD STORE AT BUDUNEY SAMTSE (FIGURE 12) AND FIELD PACK HOUSE AT RANTEYPANI (FIGURE 13)



Fig 11. Construction of Centralized Pack House at Yoetseltse Gewog



Figure 12: Cold storage site Majathang, Samtse



Figure 13: Field Pack House at Rateypani

RECOMMENDATIONS FOR FUTURE STUDIES

Although World Bank has sound ES framework, however all most all the judgement are based on visual observations and judgement some of the environmental parameters should be quantitatively assessed such as water quality, and air quality using standard measurement methods and tools.

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