CLIMATE ADAPTIVE IRRIGATION AND SUSTAINABLE AGRICULTURE FOR RESILIENCE (CAISAR) AIIB PPSF GRANT S0452A, CODE 00-452-PPSF-DTA

ENVIRONMENTAL, SOCIAL, AND CLIMATE MANAGEMENT PLAN FOR KRAPEU TRUOM SUB-SCHEME

FINAL DRAFT

Submitted To:

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EXECUTIVE SUMMARY

This document is an Environmental, Social, and Climate Management Plan (ESCMP) for the Krapeu Troum Sub-scheme, a part of the Stung Krang Ponley subproject within the larger Climate Adaptive Irrigation and Sustainable Agriculture for Resilience (CAISAR) project in Cambodia. This sub-scheme, covering 690 hectares, is designed to provide a reliable irrigation system to support agricultural activities. The Krapeu Troum ESCMP specifically addresses investments under Component 1, focusing on farm-level climate adaptation, resilience, and water use efficiency, and Component 2, aimed at rehabilitating and modernizing irrigation systems for increased agricultural production.

The ESCMP is vital for ensuring the project's sustainability by addressing potential environmental and social risks and impacts associated with infrastructure development and intensified agricultural practices. It focuses on the responsible management of water resources, crucial for both agriculture and local livelihoods. The plan promotes efficient irrigation to optimize water use, minimize water shortages, and prevent potential conflicts between upstream and downstream users. By incorporating social considerations, the ESCMP ensures that communities are actively involved in the project's planning and implementation, addressing concerns through consultations and providing fair compensation when necessary. This inclusive approach minimizes social disruptions and fosters community support. The ESCMP also ensures compliance with national and international environmental and social standards, crucial for securing funding and aligning with sustainable development best practices. By adhering to these standards, the project mitigates both environmental and social risks while promoting long-term sustainability, ensuring that the natural environment and local communities benefit from the project's outcomes.

The Krapeu Troum sub-scheme is located in Veal Pung commune, Oudong district, Kampong Speu province, and borders Thbeng Khpos and Svay communes in the Sameakki Meanchey district of Kampong Chhnang province, impacting a total of 13 villages. The sub-scheme draws water primarily from Anlong Chrey reservoir, with Kdol Dam as a secondary source. The current irrigation system faces challenges including inadequate reservoir capacity, damaged infrastructure, and inconsistent water availability. The area has experienced frequent droughts and floods, impacting agricultural productivity.

The proposed project involves rehabilitating existing irrigation canals, constructing new tertiary canals, and implementing a pilot solar-powered pumping system. Key activities under Component 1 include introducing climate-resilient agricultural practices, strengthening mechanization service providers, and promoting market-led agricultural investments. Component 2 focuses on modernizing the irrigation system with improved water regulation structures, enhanced drainage, and training for Farmer Water User Communities (FWUCs). These improvements aim to optimize water use, increase cropping intensity, and enhance resilience to climate change impacts.

The project's implementation is planned to start with a detailed design in January 2025. Procurement will follow, and construction is expected to begin after the rainy season in 2026, aiming for completion by mid-2030.

The ESCMP identifies and assesses potential environmental and social risks during various project stages. Mitigation measures are proposed to address these risks effectively.

Before and during construction:

- Unexploded Ordnance (UXO): Requires a clearance plan using certified experts before any construction.
- Air and Noise Pollution: Dust suppression, reduced machinery hours, and regular maintenance are crucial.
- Water Pollution: Construction diversion control, proper waste disposal, and water quality monitoring are essential.
- Soil Pollution: Preventing oil and chemical spills, covering restored areas with topsoil, and re-vegetation are necessary.
- Solid and Hazardous Waste: Waste management plans, including designated dump sites and proper handling procedures for hazardous waste, are needed.
- Wastewater: Proper treatment and disposal of wastewater from construction sites and worker camps are essential.
- Biodiversity Impacts: Avoiding critical habitats, minimizing vegetation clearing, and implementing a Biodiversity Action Plan are crucial.
- GHG Emissions: Using low-carbon materials and techniques, reducing waste burning, and offsetting emissions are recommended.
- Labor influx and Potential for SEA/SH: Labor management plans, worker codes of conduct, awareness campaigns, and grievance mechanisms are crucial to mitigate social risks associated with labor influx.
- Community health and safety: Safety training, traffic management plans, and health education campaigns are needed to minimize risks to community health and safety.
- Land Acquisition and Resettlement: A Resettlement Plan will be prepared based on a Land Acquisition and Resettlement Planning Framework to ensure fair compensation for any land acquired.
- Elite Capture: Transparent and inclusive consultation processes are necessary to prevent elite capture of resources, ensuring that benefits reach vulnerable groups.
- Annual or perennial crop: Promoting and monitoring water use and energy efficiency, and promote proper soil management.

During operation:

- Water Pollution: Sustainable agricultural practices, including Integrated Pest Management (IPM), are vital to minimize agricultural runoff.
- Biodiversity Impacts: Continuous monitoring and management are needed to address potential habitat loss and fragmentation.

- GHG Emissions: Promoting energy-efficient irrigation, reducing fossil fuel reliance, and adopting climate-smart agriculture are crucial.
- Social Inequality and Water Use Conflicts: Participatory planning, equitable water allocation plans, and continued community engagement are essential to prevent social inequalities and manage potential water use conflicts.
- Community Health and Safety: Promoting sustainable agricultural practices, such as IPM, and safe pesticide use will help protect community health.

The ESCMP emphasizes a comprehensive stakeholder engagement plan, with consultations conducted at national, provincial, district, commune, and village levels. This plan ensures that communities and stakeholders are informed about the project and have opportunities to share their concerns and suggestions. The consultation process included community meetings, focus group discussions, and key informant interviews. The ESCMP will be publicly disclosed in English and Khmer, available on the websites of the Ministry of Water Resources and Meteorology (MOWRAM) as the Project Implementing Unit, as well as on the websites of AIIB, IFAD, and GCF before project appraisal and approval.

A robust grievance redress mechanism (GRM) is in place to address complaints from affected people. It outlines a structured process for resolving issues related to land acquisition, labor, SEA/SH, and other project-related concerns. Different channels are available for submitting grievances, including verbal and written complaints. The GRM ensures that all grievances are documented, acknowledged, and resolved within specific timeframes. An appeal process is available if complainants are dissatisfied with the initial resolution.

The ESCMP outlines the roles and responsibilities of various stakeholders, including government agencies, contractors, and consultants, in implementing and monitoring its provisions. This includes responsibilities related to environmental and social safeguards, labor management, community engagement, and grievance redress. Contractors are required to prepare their own environmental and social management plans (C-ESMPs) outlining how they will mitigate risks and impacts. The monitoring program includes regular assessment of soil, air, and water quality, biodiversity, and social impacts, ensuring compliance with the ESCMP and identifying any necessary corrective actions.

The estimated cost for implementing the ESCMP is USD 152,000, covering expenses such as UXO clearance, assessment of land acquisition and resettlement, biodiversity management, community engagement, and monitoring activities. However, the estimate cost for the settlement of land and assets and economic displacement are going to be included after the consideration of the final decision regarding the engineering conceptual design which will be conducted by the end of 2024. The Executive Summary of the ESCMP will be publicly disclosed in both English and Khmer, ensuring transparency and accountability throughout the project's lifecycle.

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1. INTRODUCTION

1.1 Rationale

Krapeu Truom is one of the four sub-schemes located within the larger Stung Krang Ponley subproject, covering a relatively small area of 690 hectares. The sub-scheme is designed as an irrigation system aimed at supporting agricultural activities by providing a reliable source of water for crop production. It plays a crucial role in boosting agricultural productivity in the region by ensuring that farmers have consistent access to water, especially during dry seasons. This system is an essential component of local water management, contributing to improved crop yields and enhancing the livelihoods of the farming communities dependent on it.

The primary function of the Krapeu Truom sub-scheme is to regulate and distribute surface water from nearby rivers or reservoirs to irrigate agricultural lands. The system is structured to maximize water efficiency by delivering water directly to the fields, minimizing wastage, and conserving valuable water resources. This approach is particularly important in regions prone to water shortages, ensuring that crops receive the necessary water to thrive, which ultimately contributes to food security and agricultural sustainability.

Social impacts are also a critical consideration in the preparation of the ESCMP. The irrigation system is vital to the livelihoods of local communities, particularly those engaged in farming and fishing. Infrastructure development without proper social safeguards could disrupt these livelihoods, leading to economic challenges and potential social conflict. The ESCMP ensures that communities are actively engaged in the project's planning and implementation, addressing their concerns through consultations and fair compensation where necessary. This inclusive approach minimizes social disruption and fosters stronger community support for the project.

Additionally, the ESCMP is crucial for ensuring that the CAISAR Project meets both national and international environmental and social standards. Compliance with these standards is necessary for securing funding and aligning with global best practices in sustainable development. By preparing a comprehensive ESCMP, the project mitigates both environmental and social risks while promoting long-term sustainability, ensuring that both the natural environment and local communities benefit from the project’s outcomes.

1.2 Objectives of the ESCMP

The objectives of the ESCMP for Krapeu Truom sub-scheme are:

- Identify and assess environmental and social (E&S) risks and impacts that are potentially associated with investment activities proposed under Component 1 and Component 2.
- Ensure the identification and assessment of E&S risks and impacts are in accordance with the requirements of the laws and regulation of the Royal Government of Cambodia, AIIB’s Environmental and Social Framework, IFAD’s Social, Environmental and Climate Assessment Procedures (SECAP), and GEF’s Safeguard Policies.

- Apply a mitigation hierarchy to: (a) anticipate and avoid risks and impacts; (b) where avoidance is not feasible, minimize or reduce risks and impacts to acceptable levels; (c) once risks and impacts have been minimized or reduced, mitigate them; and (d) where residual risks or impacts remain, compensate for or offset them, where technically and financially feasible.
- As part of the risk and impact identification and assessment, engage a) people potentially affected by project activities (including both project beneficiaries and those potentially affected adversely, and parties interested in project implementation and operations.
- Conduct consultation, particularly with affected people who are disadvantaged/ vulnerable.
- Propose measures to avoid/ minimize/ mitigate E&S risks and impacts and compensate for adverse impacts where residual risks or impacts remain, compensate for impacts that remain, or offset residual risks, where technically and financially feasible.

Coverage of the ESCMP Krapeu Truom

This site–specific ESCMP cover project activities proposed under Component 1 and Component 2 (See brief description of investment activities in Section 2.3 below).

2. PROJECT DESCIPTION

2.1 Geographical Area of the Sub–scheme

The Krapeu Truom sub-scheme is situated in Preah Sre and Veal Pong communes within Odoung Maechey district of Kampong Speu province and positioned near the boundary of Thbeng Khpos and Svay communes, in the Sameakki Meanchey district of Kampong Chhnang province. The sub-scheme can be described as located in the boundary of 3 communes: Veal Pong, Thbeng Khpos, and Svay communes, making a total of 13 villages which are home to a total household of 2,430, making a total population of 10,535 people (out of which 5,483 are females). Geographically, it is part of the Krang Ponley sub-project, which also includes the Brambei Mom, Yutasast, and Stung Krang Bat irrigation schemes. The Krang Ponley sub-project spans across Kampong Speu, Kampong Chhnang, and Kandal provinces.

The Krapeu Truom scheme is situated along the Krang Ponley River and receives its water supply from the Anlong Chrey Dam (primary source) and the Kdol dam and river (secondary sources). The proposed target command area for the Krapeu Troum sub-scheme is 690 hectares. The Krapeu Troum sub-scheme is surrounded by the communes of Svay and Thbeng Khpos.

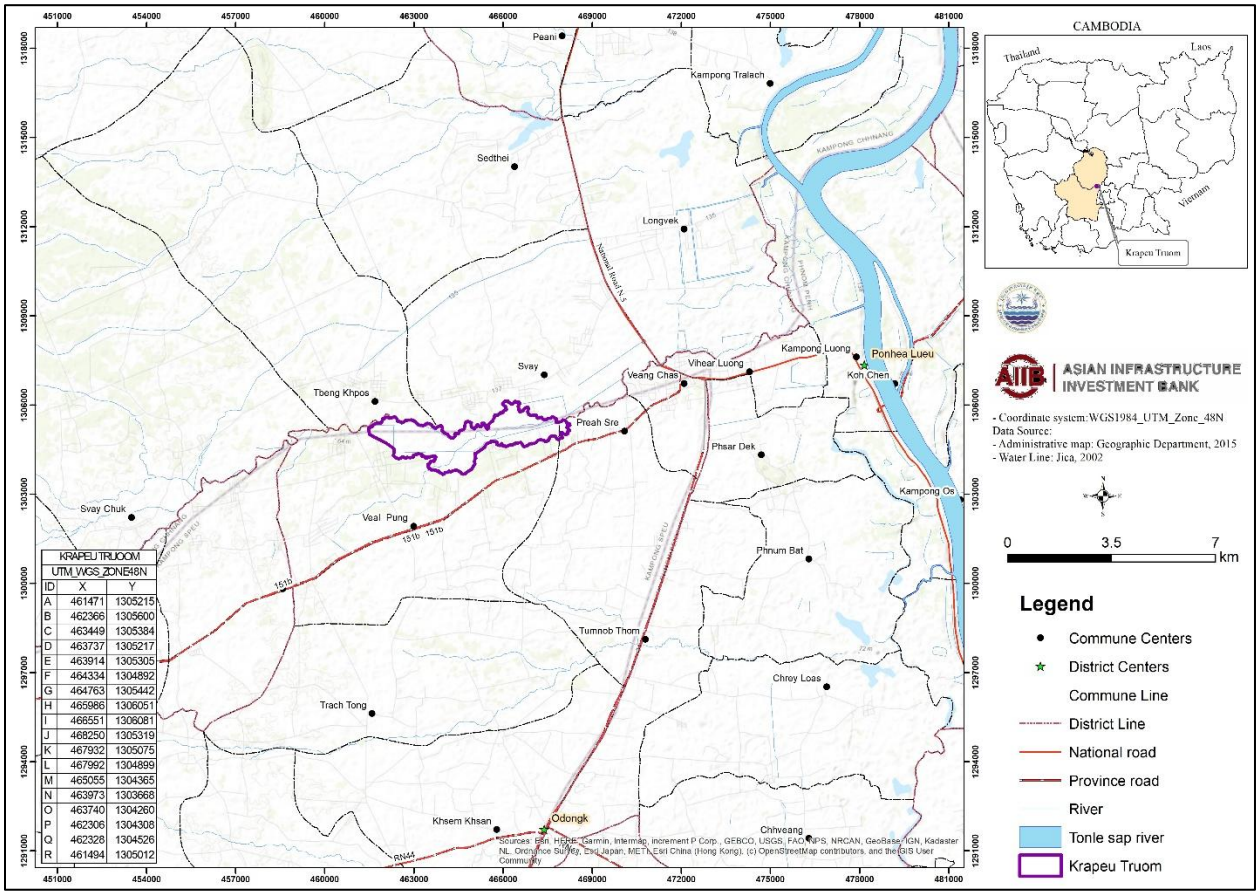
The Krapeu Truom sub-scheme, like other schemes within the Krang Ponley sub-project, is part of the Krang Ponley River Basin. The basin is characterized by its floodplain, situated approximately 10 meters above sea level, and is known for its low permeability due to fine soil particles, making it highly prone to flooding. The Krang Ponley River plays a vital role as the primary water source for these irrigation schemes.

Table 1: Administrative and population coverage of Krapeu Truom sub-scheme

No.	Province/ District	Communes	Number of Villages	Total HH	Total Population	Female Population
	Krapeu Truom					
1	Kampong Speu / Odoung Maechey	Veal Pong	8	932	4,165	2,201
2	Kampong Chhnang /Sameakki Meanchey	Thbeng Khpos	4	1,281	5,207	2,688
		Svay	1	217	1,163	594
	Total	**3**	**13**	**2,430**	**10,535**	**5,483**

(Source: Ministry of Planning, Commune Database, 2023)

Figure 1: Administrative map of Krapeu Truom sub-command area



2.2 Characteristics of the Existing Sub–scheme

2.2.1 Water Availability

The Krapeu Truom sub-scheme, located within the Krang Ponley River Basin, relies primarily on the Anlong Chrey Reservoir as its principal water source. The Kdol Dam and River serve as secondary sources, supplementing water supply when needed. This integrated system is crucial for ensuring reliable irrigation for the sub-scheme's target command area of 690 hectares.

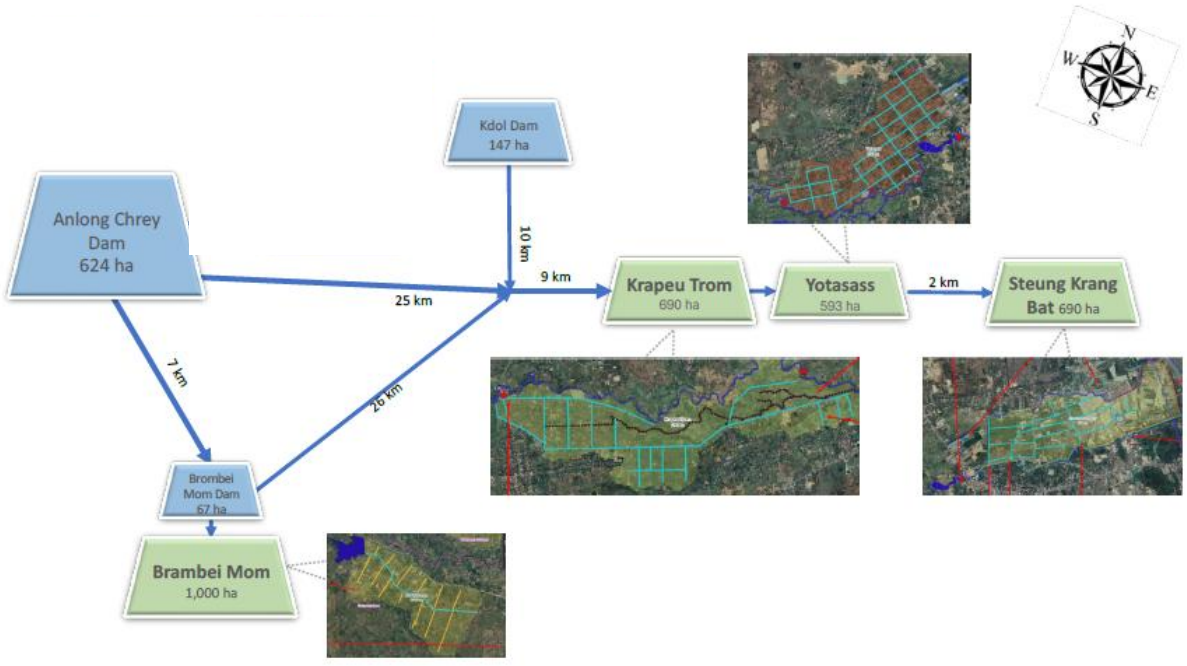
The Anlong Chrey Reservoir, while essential for the Krang Ponley sub-project's water needs, has a relatively small capacity of 30 million cubic meters (Mm^3). This poses a challenge as the estimated annual inflow into the reservoir is 123 Mm^3, significantly exceeding its storage capacity. This discrepancy highlights the need for efficient water management strategies to balance irrigation demands with the reservoir's limitations.

Despite efforts to manage water release for optimal crop planting during both early and late wet seasons, the reservoir's limited capacity may struggle to meet full irrigation demands, particularly during the dry season. Factors like inconsistent runoff, which could prevent the reservoir from reaching full capacity, further complicate water availability.

Table 2: Water sources for the Krapeu Truom sub-schemes

No	Irrigation scheme	Proposed target command area (ha)	Main Water source	Secondary water source
2	Kropeau Truom	690	Anlong Chrey Dam (30 MCM)	Kdol dam (4.7 MCM), Kdol river

Figure 2: Length from Sub-Scheme to Another of Krang Ponley



Anlong Chrey and Kdol Dam are the main water sources for Krapeu Truom sub-scheme. Given its closed location to the two dams, the sub-scheme is at an advantageous position compared to the other sub-scheme downstream of Krang Ponley River basin.

Resource	Description
Anlong Chrey Reservoir	Primary water source for the Krang Ponley scheme
Kdol Dam	Secondary water source, providing additional water supply
Ponley River	Connects the four separate scheme areas, facilitating water transfer

2.2.2 Irrigation Management

The Kropeau Troum Irrigation Project was constructed by PDWRAM with Korean Support. By operating gates on the main canal, water can be raised and brought onto some of the fields by gravity; other fields need to pump water from the canals. The FWUC was established in 2016 and is referred to by PDWRAM as a very successful one. The main management strategy focuses on releasing water early in the wet season (May and June) to support the timely planting of Early Wet Season crops, followed by a Late Wet Season rice crop. Despite these efforts, challenges persist, including potential conflicts between hydropower and irrigation needs, unclear reservoir operating rules, and inconsistent runoff that may prevent the reservoir from reaching full capacity in some years.

2.2.3 Natural challenges

Over the past 10 years, the Krapeu Truom irrigation sub-scheme has encountered several natural challenges. Drought was the most frequently reported, affecting 58% of respondents, with an average of three occurrences over the decade. However, two of these occurrences were considered serious. Floods were the second most reported issue, noted by 36% of respondents, with an average of three events, of which one was deemed serious. Storms were the third most common natural disaster, reported by 31% of respondents and occurring three times, with one of these events considered serious. Insect outbreaks were experienced by 27% of respondents, with an average of two occurrences over the last decade, but only one event was considered serious.

Table 3: Frequency and seriousness of natural disasters in Krapeu Truom sub-scheme

Types	Figures	Percent	Times	Number of Seriousness
Drought	39	58%	3	2
Flood	24	36%	3	1
Storms	21	31%	3	1
Insect outbreak	18	27%	2	1

2.3 PROPOSED INFRASTRUCTURE

2.3.1 Tentative Schedule for Sub–scheme Implementation

Should the feasibility study for the Stung Krang Ponley subproject proceed to detailed design, then allowing for the design process, procurement process and approvals, it has been assumed the following planning as displayed in the below Table.

The following assumptions have been made:

- The detailed design will start in January 2025.
- The procurement process will not take more than three quarters.
- The work construction will start after the rainy season in Cambodia with a mobilization period (last quarter of the year);
- The work construction duration will not last more two dry seasons.

Hence the construction would be able to commence at the last quarter 2026 for the sub-schemes in Stung Krang Ponley with total completion by mid-2030 for Krapeu Truom.

Table 4: Tentative implementation schedule of Krapeu Truom sub-scheme.

COMPONENTS, SUB-COMPONENTS, OUTPUTS AND ACTIVITIES	YEAR 1				YEAR 2				YEAR 3				YEAR 4				YEAR 5				YEAR 6			
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24
2.1.4 - Kropeu Trom	●	●	●	●	●	●	●	●	●	●	●	●	●	●										
Activity 2.1.4.1 - Detailed design	●	●	●	●																				
Activity 2.1.4.2 - Procurement					●	●	●																	
Activity 2.1.4.3 - Work construction and supervision								●	●	●	●	●	●	●										

2.3.2 Preferred Technical Design Option

The rehabilitation, construction and activities of CAISAR project in Krapeu Truom sub-scheme consist of canals, river training and drainage, improvement of water regulation and structure and tertiary systems, and installation of solar power systems.

Canal. The design of the canal system aims to serve both irrigation and drainage functions, considering the topography, limited water resources, and potential land resettlement issues. Where possible, the canals will follow existing paths to minimize social impacts. The size of the canals will be adjusted based on the irrigated area and the local topography. To ensure long-term sustainability and reduce water loss through percolation, it is recommended to construct the main canals using concrete linings or suitable alternatives. This approach will help maintain water distribution efficiency and improve the durability of the infrastructure.

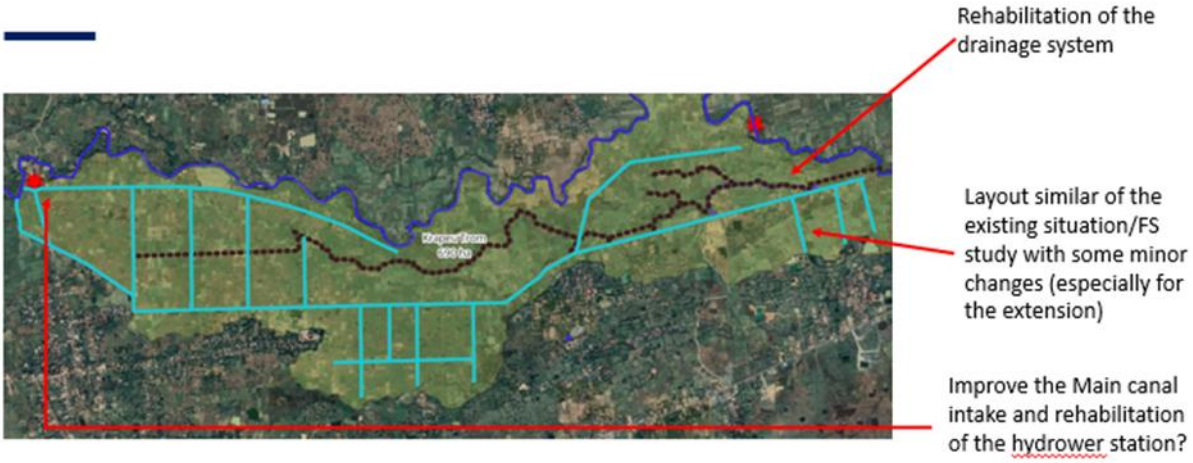
River Training and Drainage: A well-designed drainage system will be a critical component of the project, intended to manage excess runoff during the rainy season and prevent waterlogging in the command area. This system will also serve as the outlet for the on-farm drainage network, which is designed to control groundwater levels and drain surplus irrigation water. The layout of the drainage system will be based on the main natural drainage channels, upstream watersheds, rainfall over the command area, and changes in water levels in the Tonle Sap. It will also consider land use, crop types, and the planned irrigation systems to ensure efficient water management.

Water Regulation and Structures: Water will be diverted from multiple sources into the main canals according to water availability and a demand schedule prepared by the FWUC and

PDoWRAM, based on crop needs. Various cross structures will be installed to maintain the full supply level in the main and secondary canals where necessary. The flow of water into each canal will be controlled by operating the gates of the head regulators, ensuring efficient delivery to the tertiary canals, which will distribute water to individual fields. Farmers will have the option to irrigate their plots either through plot-to-plot irrigation or by constructing field ditches.

Tertiary System: The irrigation system design extends to the tertiary canal level, which is the final distribution point before water reaches individual plots. Two options are considered for the tertiary canals. The first option involves creating traditional tertiary canals through excavation, where farmers will individually pump water using diesel pumps based on their needs. However, this requires significant cooperation from beneficiaries, as canal alignment must be accepted without land compensation. The second option is to install collective solar pumping stations, a more sustainable and cost-effective solution that eliminates the need for diesel pumps and reduces CO_2 emissions.

Figure 3: Concept design of Krapeu Truom irrigation scheme.



Collective Solar Pumping System: The project aims to implement a solar-powered pumping system as a low-tech, sustainable alternative to diesel pumps, with a pilot test covering 30-50 hectares in each irrigation block. The solar pumping system requires minimal maintenance and has no fuel costs, making it an environmentally friendly and cost-effective solution for farmers. The southern part of Block A is particularly suitable for the implementation of this system due to its proximity to villages and protection from floods. The solar pumping system could cover 4,198 hectares with 80-90 units, improving water efficiency by 20% and reducing the risk of land conflicts along the canal alignment. This system would ensure reliable water delivery and support sustainable agricultural practices.

2.4 Analysis of Alternatives

2.4.1 "Without" Project Alternative

Without-project scenario, the net command area of 690 has will continue to be cultivated with a crop intensity of 100% whereas the 15% of command area (73 ha) will continue to produce vegetables with limited water sources, facing the risk of crop failure even during rainy season.

2.4.2 "With" Project Alternatives

In the with-project scenario, although the net command area will remain unchanged, improvements in water availability, management, transmission efficiency, and drainage will increase cropping intensity to 115% (covering 793 hectares). This will consist of 69 hectares of late wet-season paddy, 276 hectares of medium wet-season paddy, 345 hectares of early wet-season paddy, and 103 hectares of high-value crops, including fruits and vegetables.

The project is expected to bring the following agricultural benefits for the 2,430 farming households in the Kropeau Truom scheme: i) improved yields for wet-season rice, ii) expanded cultivation area and higher yields for dry-season rice, and iii) the introduction of high-value crops like leafy vegetables and fruit vegetables for dry-season cultivation. These changes are expected to increase agricultural productivity, raise farmer incomes, and enhance farmer resilience to drought, pests, diseases, and market risks through crop diversification.

In contrast, the without-project scenario would maintain current agricultural practices, resulting in suboptimal rice yields, poor crop diversification, lower farmer incomes, and heightened vulnerability to climate risks.

The proposed Kropeau Truom sub-scheme aims to install secondary and tertiary irrigation canals and related infrastructure within the existing system, enhancing dry-season water availability for 690 hectares of nearby farmland. Additionally, the project will establish and train Farmer Water User Communities (FWUCs) to manage and maintain the irrigation infrastructure, ensuring long-term sustainability. Further agricultural extension services will be provided to local farmers, focusing on improved agricultural techniques, value chain optimization, the use of improved seed varieties, cover crop application, and optimal fertilizer and pesticide use.

2.5 Proposed Investment under Krapeu Truom Sub–scheme

2.5.1 Key activities by Project Component

The project has three Components (summarized below). However, the ESCMP Krapeu Truom will covers investment activities proposed under only Component 1 and Component 2.

Component 1. ***Improving farm-level climate adaptation, resilience, and water use efficiency***

The objective of this component is to build climate resilience (CR) of smallholder farmers and enhance sustainable production through evidence-based planning and context-relevant climate resilient practices at the farm level. This component is designed to address the lack of knowledge and skills to deploy technologies and practices at farm level by farmers and the lack of appropriate extension services to propagate them. It will introduce farmers with various climate resilient

technologies and practices for both rice and non-rice activities such as vegetable production, poultry and aquaculture.

Sub-component 1.1 Deployment of farm-level climate adaptation and water use efficiency measures

Output 1.1: Increased capacity of farmers to deploy climate resilient (CR) practices at farm level

This output will focus on developing farmers' capacity in deploying CR technologies and practices to transform the agricultural production system to adapt to the changing climate context. Farmer's will be trained to first develop Action Plans (AP) to re-orient farmer behaviour and assist them in transforming the agriculture production system in a manner that is better adapted to factoring in the agro-ecological context and expected climate change impacts.

- Activity 1.1.1 Preparation of community-based action plans (AP) to transform agriculture with CR practices.
- Activity 1.1.2 Preparation of training materials to support implementation of the AP.
- Activity 1.1.3 Conduct trainings to create a pool of expertise to demonstrate and propagate the CR technologies and practices.
- Activity 1.1.4 Train farmers on applying CR technologies using the FFS approach.
- Activity 1.1.5 Strengthening and fostering tailored mechanization service providers for improved mechanization service delivery.
- Activity 1.1.6 community-based monitoring and evaluation (CBME) of implementation

Sub-Component 1.2 Climate adapted, value added, and market led agricultural investments

Output 1.2 CR value added, and market led agriculture investments secured.

This output involves improving and enhancing some value chains that are key for the project area and include rice, vegetable, chicken and aquaculture value chains, through the use of Public Private Producer Partnerships (4Ps) and increased access to finance, which will improve market access, climate adaptability, and ensure increased income for smallholders in the value chains.

- Activity 1.2.1 Value chain study and planning
- Activity 1.2.2 Establish District Multi-Stakeholder Platforms (MSPs)
- Activity 1.2.3 Public Private Producer Partnership Facility (4PF)

Sub-component 1.3 Improve enabling conditions, capacities and disaster risk management strategies

Output 1.3. Increased access to and use of climate information and advisory services for climate responsive agriculture planning

This sub-component will strengthen the production and dissemination of tailored agro-meteorological information to inform climate responsive management and planning of agriculture in the project target areas through ICT technologies. The aim is to ensure that

agro-meteorological services are accessible and useful to farmers to manage climate risks, access to and use of water and efficient cropping systems.

- Activity 1.3.1 Establish ICT based multi-disciplinary platform at provincial level.
- Activity 1.3.2 Building the capacities of the platform to deliver services.
- Activity 1.3.3. Establish the agromet information systems and the outreach mechanisms.
- Activity 1.3.4 Awareness raising and capacity building of farmers and stakeholders in applying the *services.*

Sub-component 1.4 Rural roads

Output 1.4: Increased resilience of farm road infrastructure to climate change

- Activity 1.4.1 Initial planning and identification
- Activity 1.4.2 Technical survey and design considerations, preparation of cost estimation
- Activity 1.4.3 Improve 50 Kilometers of farm roads.
- Activity 1.4.4 Handing over of the completed works.

Component 2: Irrigation Infrastructure for increased resilience

Component 2 will focus on rehabilitating/creating and modernizing hydraulic infrastructure, including canals, ponds, flood-proof infrastructure (river, drain) and to provide high-efficiency climate-resilient irrigation systems for adapting to both increasing flood and drought conditions. It will include support and capacity building to O&M operators at both, Provincial (PdoWRAM) and scheme (FWUC) level, to ensure the sustainability of the scheme. The output will secure and increase farmer's agricultural production by improving the irrigation supply and protect crops from water-related disasters.

Component 2 is linked with Component 1 such that it facilitates the implementation of CR on farm crop and water management practices through improved field level water supply delivery and drainage. It will focus on rehabilitating and modernizing of irrigation and flood protection/drainage infrastructure in the six sub-projects, including irrigation and drainage canals, flood control embankments, and ponds, to provide high-efficiency climate-resilient irrigated agriculture systems for adapting to both increasing flood and drought conditions.

Sub-Component 2.1: Modernization of irrigation scheme and ponds

- Activity 2.1.1 Technical analysis, field surveys and preparation of plans for system upgrading.
- Activity 2.1.2 Implementation of infrastructure upgrading.

Activity 2.1.3 Preparation of canal O&M plans including application of ICT and SCADA for operation***Sub-Component 2.2: Flood-proofing and Drainage improvements***

- Activity 2.2.1 Establish flood monitoring, information, and early warning systems.
- Activity 2.2.2 Strengthening and construction of flood control and drainage infrastructures.

Sub-Component 2.3: Establishments and training of Farmers Water User Communities (FWUC)

- Activity 2.3.1 Formation of institutional strengthening of the FWUC
- Activity 2.3.2 Build technical capacities of FWCU for canal structure O&M
- Activity 2.3.3 prepare long term financing plan for O&M of the systems including the WUAS.

Sub-Component 2.4: Water information and Management (SCADA)***Component 3. Institutional Strengthening***

Sub-Component 3.1 MOWRAM capacity Support.

Output 3.1 Strengthened MOWRAM Capacity

Sub-Component 3.2 Strengthening of NDA and NCDD.

Output 3.2 Improved capacities for climate action monitoring

- Activity 3.2.1 Preparation of Loss and Damage Strategy
- Activity 3.2.2 Strengthen national M&E process for climate action

Activity 3.2.3 Enhancing Capacity of NDA and other stakeholders.

2.6 Project Area of Influence

2.6.1 Definitions

Under Krapeu Truom sub–scheme, term "Areas of Influence" (AoI) comprise, as appropriate, areas that are likely to be affected by the following:

(i) **Project activities**, including i) project activities and the facilities under Component 1 and Component 1 that are directly owned, operated or managed (including by contractors) and; ii) the impacts from unplanned but predictable developments caused by the project that may occur later or at a different location; or indirect project impacts on biodiversity, or on ecosystem services upon which affected communities' livelihoods are dependent;

(ii) **Cumulative impacts**[1] that result from the incremental impacts (direct and indirect) from a) project activities proposed under Krapeu Truom sub–scheme on the project command area, and b) Krapeu Truom sub–scheme, and combined cumulative effect from Krapeu Truom sub–scheme, past and planned projects, on the area downstream the Krapeu Truom sub–scheme, and other relevant projects; and

(iii) are facilities not included in the Project set out in the Legal Agreements governing the Project, but they are: (a) directly and materially related to the Project, (b) carried out, or planned to be carried out, contemporaneously with the Project; and (c)

[1] Cumulative impacts are limited to those impacts generally recognized as important on the basis of scientific concerns and/or concerns from Affected Communities.

necessary for the Project to be viable and would not be carried out if the Project did not exist". Should adopt from the AIIB ES Framework

2.6.2 Areas of Influence of Krapeu Truom Sub–scheme

Under CAISAR, since project design for Krapeu Truom is still ongoing, the area of influence for Krapeu Truom is anticipated based on: a) target command area of each scheme (where most proposed project activities will take place during project construction, and later during project operation), and b) the environmental footprint that are likely caused by project activities during project construction (as direct and indirect impacts due to activities under Component 2), and by project activities (mainly cumulative impacts due to intenstified crop production activities under component 1).

Based on investment activities proposed under project component 1 (improved crop production) and component 2 (improved irrigation access), the sub-scheme's area of influence is defined by the following investment activities:

- **Command area:**
  - Areas with increased number of crops per years (under Component 1)
  - Specific location where existing irrigation canals are repaired/improved, extended (at selected location at tertiary level), new small-scaled water gates
- **Construction areas** (mostly inside command areas)
  - Workers' camps
  - Areas where construction materials are stockpiled and machineries and construction vehicles are parked, repaired, operated during construction process.
  - All routes used by contractors and subcontractors for operation of vehicles and machinery for construction (e.g. access roads, communal roads)
- **Road networks**
  - All roads, routes that connect the construction sites and the sites that are used as a) disposal site, b) construction material supply site, c) borrow pits, d) quarries, etc.
- **Disposal site(s), borrow pit(s)**
- **Any area affected by environmental footprint**
  - As defined by the area subject to noise, vibration, air, soil, water pollution due to project activities.
- **Land impacts**
  - Any land area that are acquired for the purpose of expansion of irrigation canals (Compopent 2) and/or farm roads (Component 1).

It is noted that while direct and indirect impacts could be reasonably anticipated based on currently proposed scope of works and prior experience for similar works, cumulative impacts, particularly their spatial extent and severity (over the time) require collection of supporting scientific evidence from data collected under project's environmental and social monitoring program (See also Chapter 5 – Environmental & Social Risks, Impacts, and Mitigation).

These above anticipated areas of influence need to be updated when more information becomes available to allow a more reliable assessment, particularly when project detailed design is completed, and construction measures proposed by construction constractors are identified. Future update on area of influence (at respective sub-scheme) will be made on the basis of

updated environmental and social assessments once a) locations of construction sites, auxiliary facilities, and logistics operations are confirmed, and b) the full scope of the project's impacts (direct, indirect, and cumulative) is firmed up based on detailed engineering design (for Component 2) and project implementation approach (for Component 1).

3. LEGAL AND INSTITUTIONAL FRAMEWORK

Following a framework for effective project development as well as environmental sustainability, the project owner shall comply with the national legal framework and protocols ratified by the Kingdom of Cambodia. For CAISAR Project, there are national laws, agreements, guidelines and relevant legal instruments as described below:

3.1 Royal Government of Cambodia's Legal Framework

3.1.1 National legal framework

3.1.1.1 The Constitution of the Kingdom of Cambodia (1993)

The Constitution is the highest legal authority in Cambodia and establishes the fundamental rights and duties of citizens and the state. It sets the groundwork for environmental protection, governance, social inclusion, and public well-being, ensuring that environmental and social rights are integrated into national laws.

3.1.1.2 Legal Framework related to the Management and Conservation of Natural Resources and Biodiversity

This framework aims to ensure sustainable use and conservation of Cambodia's natural resources, including water, land, biodiversity, and ecosystems. Laws under this framework help guide ESCIA processes to minimize environmental degradation.

- **Law on Environmental Protection and Natural Resource Management (1996)**: Establishes principles for sustainable development and environmental protection, requiring environmental assessments for projects impacting natural resources.
- **Environmental and Natural Resources Code 2023**: Provides a comprehensive approach to natural resource governance, setting standards for the sustainable management of resources.
- **Law on Land Management, Urban Planning and Construction (1994)**: Governs land use, urban development, and construction to ensure that environmental and social impacts are mitigated.
- **Law on Water Resource Management (2007)**: Regulates water usage, conservation, and management, ensuring that development projects do not negatively impact water resources.
- **Law on Fisheries (2006)**: Focuses on sustainable fisheries management and biodiversity conservation in aquatic ecosystems, crucial for ESCIA in projects affecting water bodies.

- **Protected Areas Law (2008)**: Establishes protected areas to conserve biodiversity and natural resources, ensuring that development projects respect protected regions.
- **Land Law (2001)**: Regulates land ownership and management to promote sustainable land use practices.
- **Sub-Decree on Water Pollution Control (1999)**: Sets standards for water quality and pollution control in development projects.
- **Sub-Decree on Environmental Impact Assessment (1999)**: Requires EIA for development projects, ensuring environmental impacts are assessed and mitigated.
- **Sub-Decree on Air Pollution Control and Sound Disturbance (2000)**: Provides standards to control air pollution and noise disturbances from development projects.
- **Sub-Decree on Solid Waste Management (1999)**: Governs solid waste management in projects, preventing environmental harm from improper waste disposal.
- **Prakas on Environmental Impact Assessment Reports (1999)**: Offers guidelines for preparing EIA reports to ensure thorough assessment of environmental impacts.
- **Prakas on Hazardous Substances (2015)**: Sets limits on the disposal of toxic substances, preventing environmental contamination from hazardous materials.

3.1.1.3 Legal Framework related to Labour, Public Well-Being, and Safety

This framework emphasizes the protection of workers' rights, public safety, and well-being in project development. It ensures that development projects comply with labor laws and safety standards.

- **Labor Law (1997)**: Protects workers' rights, ensuring safe and fair working conditions during project implementation.
- **Law on Roads (2014)**: Governs the construction and maintenance of roads, with provisions for minimizing environmental and social impacts.
- **Law on Road Traffic (2014)**: Addresses traffic management and safety measures to prevent accidents and disruptions during development.
- **Law on Suppression of Human Trafficking and Sexual Exploitation (2008)**: Protects vulnerable populations during project implementation from exploitation and trafficking.

3.1.1.4 Legal Framework related to Governance and Social Inclusion

This framework ensures that development projects promote inclusive governance, respect cultural heritage, and safeguard social rights. It includes provisions for tax obligations, land acquisition, resettlement, and social protection schemes.

- **Law on Taxation (1997)**: Governs the taxation of development projects, ensuring they contribute to national revenue and economic sustainability.
- **Sub-Decree on Construction Permit (1993)**: Requires permits for construction activities, ensuring they comply with environmental standards and social safeguards.

- **Law on Protection of the Rights of Persons with Disabilities (2009)**: Ensures that development projects consider the needs and rights of people with disabilities.
- **Law on Social Security Schemes (2002)**: Provides social protection for workers, ensuring their well-being during project execution.
- **Sub-Decree on Health Care Scheme (2016)**: Extends social security and health care protection to workers involved in development projects.
- **Law on the Protection of Cultural Heritage (1996)**: Safeguards cultural heritage sites, ensuring that development projects do not damage or destroy culturally significant areas.
- **Expropriation Law (2010)**: Regulates land acquisition for public purposes, ensuring fair compensation and minimizing the impact on affected populations.
- **Sub-Decree on Land Acquisition and Resettlement (2018)**: Provides procedures for land acquisition and involuntary resettlement, particularly for externally financed projects.
- **Sub-Decree on Social Land Concession (2003)**: Allows for the allocation of state land to landless citizens, particularly when development projects displace communities.
- **Sub-Decree on State Land Management (2005)**: Regulates the management of state land, ensuring its sustainable use in development.
- **Sub-Decree on River Basin Management (2015)**: Promotes sustainable management of river basins, ensuring that development projects do not harm water systems and dependent ecosystems.

3.1.2 International Conventions and Treaties

Cambodia has ratified all eight of the ILO's fundamental conventions, which cover core labour standards recognized as human rights. These conventions focus on issues such as freedom of association, elimination of forced labour, abolition of child labour, and elimination of discrimination in employment.

- **Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87)**: Ratified by Cambodia in 1999, this convention protects workers' and employers' rights to freely form and join organizations without interference, ensuring autonomy and safeguarding against dissolution by authorities.
- **Right to Organise and Collective Bargaining Convention, 1949 (No. 98)**: Ratified in 1999, it protects workers' rights to organize, engage in collective bargaining, and prevents discrimination for union activities, promoting fair wage negotiations and just working conditions.
- **Forced Labour Convention, 1930 (No. 29)**: Ratified in 1969, this convention aims to eliminate all forms of forced labour, including coercive work for public works or political purposes, protecting workers' rights and dignity.

- **Abolition of Forced Labour Convention, 1957 (No. 105)**: Ratified in 1999, it strengthens the prohibition of forced labour for political coercion, discipline, or discrimination, ensuring freedom and justice in the workplace.
- **Minimum Age Convention, 1973 (No. 138)**: Ratified in 1999, it sets a minimum age for employment (usually 15) to prevent child labour, promoting access to education and protection from hazardous work.
- **Worst Forms of Child Labour Convention, 1999 (No. 182)**: Ratified in 2006, this convention seeks to eliminate extreme forms of child labour like slavery, trafficking, and hazardous work, prioritizing children's safety and rehabilitation.
- **Equal Remuneration Convention, 1951 (No. 100)**: Ratified in 1999, it promotes equal pay for men and women for work of equal value, combating gender-based wage discrimination and fostering economic justice.
- **Discrimination (Employment and Occupation) Convention, 1958 (No. 111)**: Ratified in 1999, this convention addresses workplace discrimination based on race, gender, religion, and other factors, promoting equal treatment and opportunities for all workers.
- **Employment Policy Convention, 1964 (No. 122)**: Ratified in 1971, it requires active employment policies to promote full, freely chosen employment, aiming to reduce unemployment and support economic and social development.
- **Weekly Rest (Industry) Convention, 1921 (No. 14)**: Ratified in 1969, this convention guarantees a weekly rest period of at least 24 consecutive hours for workers, helping protect their health and well-being.
- **Labour Inspection Convention, 1947 (No. 81)**: Ratified by Cambodia in 1974, this convention establishes labour inspections in industrial and commercial workplaces to ensure compliance with national labour laws, promoting safe, fair, and decent working conditions.
- **Labour Inspection (Agriculture) Convention, 1969 (No. 129)**: Ratified in 1999, it extends labour inspection to agriculture, ensuring workers in this sector, including migrant and seasonal labourers, are protected by labour laws and safe working conditions are maintained.
- **Tripartite Consultation (International Labour Standards) Convention, 1976 (No. 144)**: Ratified by Cambodia in 2009, this convention promotes consultation between governments, employers, and workers on international labour standards. It ensures that all stakeholders are involved in the implementation of labour policies, enhancing social dialogue and cooperation for fair labour practices.

3.2 AIIB'S Environmental and Social Framework (ESF)

The Asian Infrastructure Investment Bank's (AIIB) Environmental and Social Framework (ESF) (2022) outlines the principles and standards to ensure environmentally and socially sustainable development practices for projects it finances. The framework consists of several Environmental and Social Standards (ESS) that provide comprehensive guidance on managing potential impacts and risks associated with AIIB-financed projects. AIIB's Environmental and Social Framework (ESF) (2022) are summarised here.

- **Environmental and Social Standard 1: Environmental and Social Assessment and Management**: These standard guides the assessment and management of environmental and social risks, requiring projects to evaluate alternatives, mitigate impacts, and disclose information. It emphasizes protecting the natural environment, particularly biodiversity and critical habitats, while addressing pollution, resource efficiency, and climate change. Social risks, including impacts on vulnerable groups, gender, and access to resources, must be considered. The standard also covers labor conditions, community health and safety, child labor, and security, ensuring proper grievance mechanisms, monitoring, and implementation plans.
- **Environmental and Social Standard 2: Land Acquisition and Involuntary Resettlement.** The standard provides guidance to avoid Involuntary Resettlement where possible. The requirements under the standard contain 18 points of action to which the executing agency needs to follow.
- **Environmental and Social Standard 3: Indigenous Peoples.** The standard aims to design and carry out projects in a way that fully respects Indigenous Peoples' identity, dignity, human rights, economies, and cultures. This ensures that Indigenous Peoples: (a) receive social and economic benefits that are culturally appropriate; (b) do not experience negative impacts from the projects; and (c) can actively participate in projects that affect them. The standard contains 15 points to follow.

3.3 IFADs' SECAP

The International Fund for Agricultural Development's (IFAD) Social, Environmental, and Climate Assessment Procedures (SECAP) provides a framework to ensure that IFAD-financed projects are sustainable, socially inclusive, and environmentally sound. SECAP is composed of several standards that address various environmental and social considerations. Listed in the ToR, here is the summary of the applied standards:

- **Standard 1: Biodiversity Conservation**: This standard ensures the protection of biodiversity by requiring projects to assess and mitigate biodiversity risks, avoid critical habitats, and provide compensation for unavoidable damages. It promotes sustainable use of genetic resources, discourages invasive species, and emphasizes expert advice and adherence to protected area laws.
- **Standard 2: Resource Efficiency and Pollution Prevention**: Focuses on efficient use of resources and pollution control. It requires projects to reduce energy, water, and

material use, manage hazardous materials safely, and prevent pollution, with an emphasis on sustainable natural resource management, including water, soil, fisheries, and forests.

- **Standard 3: Cultural Heritage**: This standard ensures the protection of tangible and intangible cultural heritage by screening and managing impacts, consulting local communities, and preserving access to cultural sites. Projects must avoid, minimize, or mitigate damage and follow legal requirements in protected areas.
- **Standard 4: Indigenous Peoples**: Supports and empowers indigenous communities by requiring free, prior, and informed consent (FPIC), promoting equitable resource access, and protecting cultural heritage. Projects must involve indigenous peoples in decision-making, ensure fair benefits, and avoid involuntary resettlement.
- **Standard 5: Labor and Working Conditions**: Sets requirements for safe, non-discriminatory workplaces, prohibiting forced and child labor. It requires the establishment of grievance mechanisms, safety protocols, and equal opportunities, with contractors and suppliers adhering to these standards.
- **Standard 6: Community Health and Safety**: Requires projects to assess and manage health risks, prevent exposure to hazards, and ensure infrastructure safety. It includes emergency preparedness, traffic and security management, and protection against gender-based violence.
- **Standard 7: Physical and Economic Resettlement**: Ensures resettlement is conducted legally and fairly, avoiding forced evictions. It requires special consideration for vulnerable groups, economic displacement, and establishing grievance mechanisms for affected communities.
- **Standard 9: Climate Change**: Ensures projects address climate risks and reduce GHG emissions. It mandates climate risk screening, adoption of climate-smart practices, and GHG accounting to guide project design towards reducing environmental impacts.

3.4 GEF'S Environmental and Social Policies

GEF adopts the interim environmental and social safeguards to identify, measure, and mitigate environmental and social risks based on IFC Performance Standards (PS). Under CAISAR, the following PSs are applied:

- Performance Standard 1 – Assessment and Management of Environmental and Social Risks and Impacts;
- Performance Standard 2 – Labor and Working Conditions
- Performance Standard 3 – Resource Efficiency and Pollution Prevention
- Performance Standard 4 – Community Health, Safety, and Security

- Performance Standard 5 – Land Acquisition and Involuntary Resettlement
- Performance Standard 6 – Biodiversity Conservation and Sustainable Management of Living Natural Resources
- Performance Standard 7 – Indigenous Peoples
- Performance Standard 8 – Cultural Heritage.

3.5 Gap Analysis of National Legal Framework and Policies of AIIB, IFAD and GCF

The study and analysis of the national legal framework against the requirements under the policies of AIIB, IFAD and GCF can be summarised as Table 5.

Overall, the Royal Government of Cambodia (RGC) has established various legal documents ranging from royal decrees, sub-decrees, and circulars framing the management, and implementation of all types of development projects and activities within the country at the pre-construction, construction and implementation periods. The laws cover the management and protection of the natural resources, and biodiversity including underground, inland and water bodies. These legal frameworks also contain the standards that are applicable to the country context including water quality, soil quality, air, noise quality and vibration. Regarding human well-being including health, safety, labour and sexual exploitation, the country has made significant progress over the past years promoting the working environment of workers and labour forces embracing various laws and policies for ensuring the well-being of workers as well as the compliances that employers must comply. Laws to protect sexual exploitation, and social protection guarded the public, especially the vulnerable including the poor, and people with disability. Although the country's legal frameworks cover the requirements, there are still limited report in terms of actual enforcement which need to be taken care where a proper implementation plan and resources are needed.

Table 5: Gap Analysis of National Legal Framework and Policies of AIIB, IFAD and GCF

No.	Standards/ Policies			Coverage	RGC's Corresponding Legal Framework	Gap Analysis and suggestions	Proposed measures to address the gaps
	AIIB	IFAD	GCF				
1	ESS1		PS1	Environmental and Social Assessment and Management	• Environmental Code and Natural Resource Management (2023), • Law on Water Resource Management (2007), • Law on fisheries (2026), • Sub-Decree on Water Pollution Control (1999), • Sub-Decree on Environmental Impact Assessment (1999), • Sub-Decree on Air Pollution Control and Sound Disturbance (2000), • Sub-Decree on Solid Waste Management (1999), • Prakas on the General Guideline for Preparing the Initial and Full Environmental Impact Assessment Reports (1999), • Prakas on the Launch of Standards of the Quantity of Toxins or Hazardous Substances Allowed to be Disposed (2015)	The RGC has established a wide range of regulations especially in the recent Environmental Code and Natural Resource Management (2023) that aim to environmental protection and natural resource management are well aligned to the provisions of the AIIB ESS1.	This ESCIA covers both direct, indirect, and cumulative impacts and mitigation measures, taking a holistic approach to the project and looking at impacts in an integrated way.
2	ESS2	S7	PS5	Land Acquisition and Involuntary Resettlement	• Law on Land Management, Urban Planning and Construction (1994), • Land Law (2001), • The Expropriation Law (2010), • RGC's Sub-Decree No. 22 ANK/BK (2018) on the Promulgation of the Standard Operating Procedures for Land Acquisition and Involuntary Resettlement (SOP-LAR) for Externally Financed Projects in Cambodia, • Sub-Decree No.19 on Social Land Concession of March 2003, • RGC's Sub-Decree No.118 ANK/BK (2005) on State Land Management, • RGC's Sub-Decree No.98 ANK/BK (2015) on River Basin Management	The RGC has the SOP-LAR which is well aligned with the provisions in the AIIB ESS 2. The AIIB ESS 2 on land acquisition and involuntary resettlement recognizes that project related land acquisition and land use can have impacts on communities. The RGC's SOP-LAR is consistent with the specific requirements under the AIIB ESS 2 on consultation, grievance redress, social support, resettlement assistance, standard of living of poor and vulnerable, entitlements for persons without title or legal rights except for land, information disclosure, payment of compensation and entitlements prior to	According the RGC's SOP-LAR, an income restoration program would be provided in order to re-estalbish sources of livelihoods for those affected households who have permanently lost their sources of livelihood. In this CAISAR project, the DRPs will include provisions to ensure livelihood restoration program are robust and can accurately meet the aim of livelihood restoration in line the AIIB ESS2.

No.	Standards/ Policies			Coverage	RGC's Corresponding Legal Framework	Gap Analysis and suggestions	Proposed measures to address the gaps
	AIIB	IFAD	GCF				
						physical displacement, and the supervision and monitoring of implementation of resettlement plans. However, there are gaps on negotiated settlement and livelihood restoration. The SOP-LAR does not describe procedures for negotiated settlement and lack of clear benchmark to assist monitoring and evaluation to confirm if the affected households restore their livelihood to the level prevailing prior to the beginning of the project implementation.	
3	ESS3	S4	PS7	Indigenous Peoples	• The Constitution of Cambodia (1993) • Land Law (2001)	No detailed regulations on how to avoid impacts to Indigenous Peoples or how to include them in project benefits. Lack of requirement to consult IP(s) in a manner that is culturally appropriate and special disclosure and consultation requirements as described in the AIIB ESS3.	An IPPF has been prepared on the basis of the AIIB ESS3. The IPPF details procedures on the preparation of IPP(s) and how to conduct meaningful consultation and disclose that is culturally appropriate.
4	ESS1	S1	PS6	Biodiversity conservation	• Environmental Code and Natural Resource Management (2023),	The code requires a proper consideration of biodiversity resources and payment of ecosystem services which support the conservation process. There is limited guidance on how to compensate in the ecosystem services once its pristine condition is affected.	This ESCIA include the biodiversity assessment and management plan.
5	ESS1	S2	PS3	Resource efficiency and pollution prevention	• Environmental Code and Natural Resource Management (2023), • Sub-Decree on Environmental Impact Assessment (1999), • Sub-Decree on Air Pollution Control and Sound Disturbance (2000),	The RGC has in place a set of separate provision and requirements for pollution prevention and management that are well align with the AIIB ESS 1 that aims to promote the sustainable use of	This ESCIA has included all relevant national laws and regulation as well as the requirement for AIIB ESS1.

No.	Standards/ Policies			Coverage	RGC's Corresponding Legal Framework	Gap Analysis and suggestions	Proposed measures to address the gaps
	AIIB	IFAD	GCF				
					• Sub-Decree on Solid Waste Management (1999), • Prakas on the General Guideline for Preparing the Initial and Full Environmental Impact Assessment Reports (1999), • Prakas on the Launch of Standards of the Quantity of Toxins or Hazardous Substances Allowed to be Disposed (2015)	resources and avoid or minimize the pollution from sources/project activities.	
6	ESS1	S3	PS8	Cultural heritage	• Environmental Code and Natural Resource Management (2023), • Law on the Protection of Cultural Heritage (1996)	The RGC has in place the law on protection of cultural heritage aligns with the requirement of the AIIB ESS1. However, there is lack of detail procedures for protection of the intangible cultural heritage.	This ESCIA provided details procedures and requirement to protect both tangible and intangible cultural heritage through Chance Find Procedure (Annex xx).
7	ESS1	S5	PS2	Labor and working conditions	• Labor Law (1997), • Law on Taxation (1997), • Sub-Decree on Construction Permit (1993), • Law on Social Security Schemes for Persons defined by the Provision of the Labor Law (2002), • Sub-Decree on Establishment of Social Security Scheme "Health Care Scheme" for Persons Defined by the Provisions of the Labor Law (2016)	The RGC has in place a set of law and regulations on labour and working conditions which is consistent with the requirement of the AIIB ESS1. However, the enforcement of these law and regulation is still limited. For example, regulation against forced labor and using child labor are not strictly enforced.	The ESCIA provides provisions to monitor compliance by contractor and of their primary suppliers in bidding documents and supervision contracts in order to prohibit using forced labour and child labour.
8	ESS1	S6	PS4	Community health and safety	• Law on Road Traffic (2014), • The Law on Suppression of Human Trafficking and Sexual Exploitation 2008, • Law on the Protection and the Promotion of the Rights of Persons with Disabilities 2009,	The RGC has established Labor Law the protect the health and safety of the workers. However, the concern and mitigation are more on individual rather than community as a whole. The AIIB ESS1 aims on protection of both individual and community for health and safety.	The ESCIA provides provisions to monitor compliance by contractor on community and health safety in bidding documents and supervision contracts. The requirement on raising awareness to local community on health and safety are also included in the bidding documents.

No.	Standards/ Policies			Coverage	RGC's Corresponding Legal Framework	Gap Analysis and suggestions	Proposed measures to address the gaps
	AIIB	IFAD	GCF				
9	ESS1	S9	PS1	Climate change	• Environmental Code and Natural Resource Management 2023	The newly adopted code requires all relevant sectors to integrate climate resilient concepts into their strategic action plan along with different measures to tackle the issues. No gap being identified.	

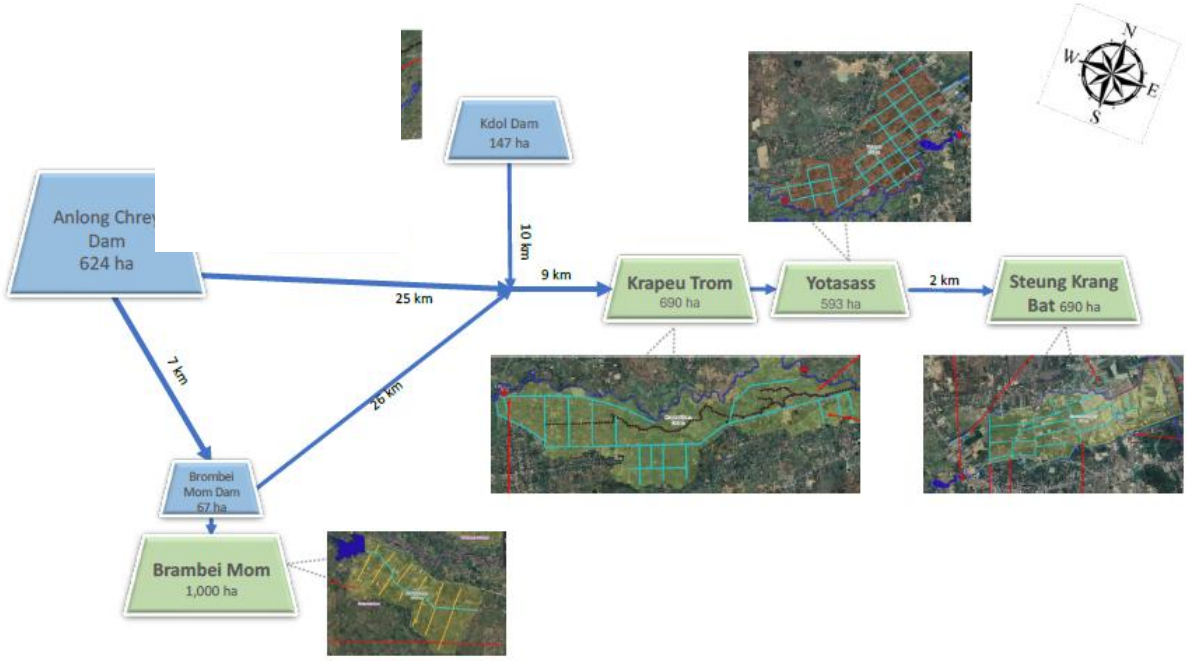
4. BASELINE CONDITIONS

4.1 Physical Conditions

4.1.1 Existing Infrastructure

Krapeu Truom is part of the larger Stung Krang Ponley basin, which serves as the main water source for several irrigation sub-schemes. The basin contains three major reservoirs—Anlong Chrey, Brambei Mom, and Kdol dam— that have improved downstream water availability for irrigation and play a key role in flood control. However, the Anlong Chrey reservoir, with a capacity of just 30 million cubic meters (Mm^3), is small relative to the annual inflow of 123 Mm^3 and the irrigation needs of the region. A small hydropower station was installed at the site but remains unused due to an insufficient water supply.

Figure 4: Length from Sub-Scheme to another of Krang Ponley



4.2 Environmental Conditions

4.2.1 Air Quality and Noise

Stung Krang Ponly located in two (2) provinces – Kampong Chhnang and Kampong Speu. At provincial level, the air pollution level in Kampong Chhnang province is considered moderate. The air pollution level in Kampong Speu province also consider moderate. The AQI is 58[2], which is equivalent to 12.7 $\mu g/m^3$. The Stung Krang Ponly is in the rural settings; therefore, the baseline ambient air quality, noise and vibration is considered generally good. Ambient air quality is sometime affected by dust from tillage and unpaved road users, including smoke from burning of rice stubble after harvest and burning from

[2] https://www.iqair.com/cambodia/kampong-speu, accessed on 23rd September 2024.

swidden cultivation activities. Whilst noise and vibration disturbance are sometime affected by motorist. However, the impacts are minor and short time.

Noise and vibration of the project locations in each sub-scheme are currently affected mainly by the commuters mainly along the roads within the areas which can be either the national or local road. As they are subjected to change over time, the testing of noise and vibration are required to be conducted right before the beginning of the construction.

4.2.2 Soil Quality

The Krapeu Truom sub scheme was represented by one location (SS.04). The analysis results, presented in the table below, provide valuable insights into the physical, chemical, and biological properties of the soils at these locations, which can inform agricultural management practices and decision-making.

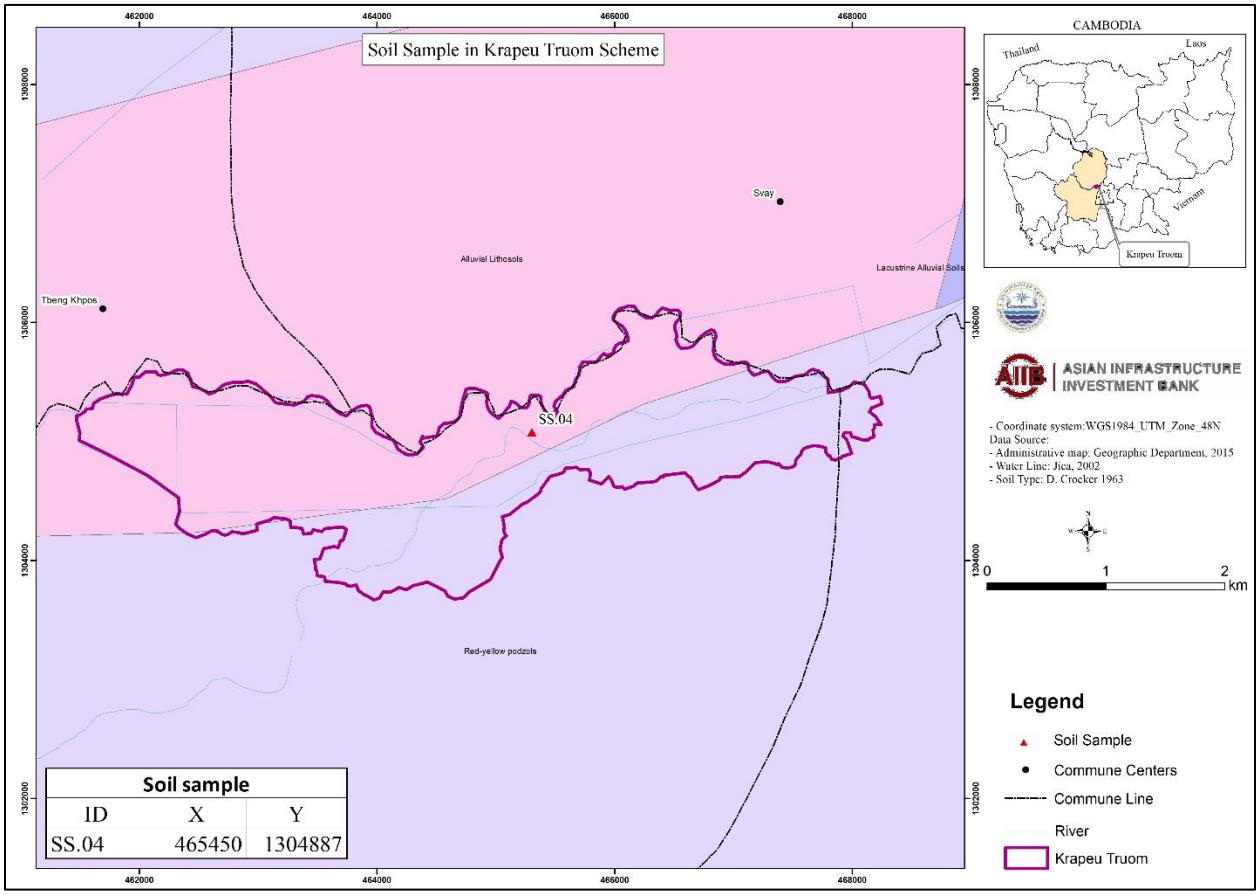
Table 6: Soil analysis results in an agricultural context

No.	Description Parameter		Result of SS.04
1	Particle Size (Pipette Method)	(<0.002mm), Clay %	14.95
		(0.002-0.02 mm), Fine Silt, %	30.00
		(0.02-0.05 mm), Coase Silt, %	19.81
		(0.05-0.2 mm), Fine Sand, %	31.12
		(0.2-2 mm), Coase Sand, %	5.92
2	Ninnu Moisture %, (Oven dry at 105 °C and 24 hours)		2.64
3	Total Carbon (Black & Walkey Method), C%		1.63
4	Total Nitrogen (Kjeldal Sulfuric Method), N%		0.14
5	C/N Ratio (Unit)		12
6	Organic Matter (0M) %		2.80
7	Total Phosphorus (Nitric Digestion) P %		0.044
8	Available Phosphorus (Bray II), P (ppm)		29
9	Cation Exchange Capacity C.E.C meq/100g Soil (Method,1M Ammonium Acetate at pH=7 & Leach with 10% NaCl)		16.50
10	Exchangeable Cation (meq/100g Soil), (Method, IM Ammonium Acetateat H=7)	Calcium (Ca)	8.30
		Magnesium (Mg)	2.37
		Sodium (Na)	2.57
		Potasium (K)	0.36
	Total Exchangeable Bases (meq/100g soil)		13.60
11	Bass Saturation %		70
12	Exchange Acidity meq/100g Soil, (1 M KCl Method)		10.00
13	Exchange Al meq/100g Soll, (1 M KCl Method)		0.12
14	Electrode Conductivity µS/cm, (1:5 Soil: water)		108.40

15	pH H2O (1:5 Soil: water)	7.41
16	pl KCL (1:5 (Soil: IN KCL)	6.23

(Source: Laboratory of the General Directorate of Agriculture, MAFF, 2024)

Figure 5: Location of soil sample selection



The soil quality testing results for Krapeu Truom SS.04 reveal a balanced texture that includes a mix of clay (14.95%), silt (49.81% combined fine and coarse silt), and sand (37.04% combined fine and coarse sand). This composition suggests the soil has good moisture retention with adequate drainage, providing a suitable environment for a variety of crops. The moderate moisture content (2.64%) indicates the soil was relatively dry at the time of testing, but it possesses the capacity to hold water effectively due to its balanced particle size distribution.

In terms of fertility, the organic matter content (2.80%) and total carbon (1.63%) levels are sufficient to promote healthy plant growth, providing a good base for nutrient availability. However, the total nitrogen level (0.14%) is low, indicating that nitrogen supplementation may be necessary to support optimal plant growth. The C/N ratio of 12 suggests a balanced rate of organic matter decomposition, ensuring a steady release of nutrients over time. Although the phosphorus levels, both total (0.044%) and available (29 ppm), are moderate, some crops may require phosphorus fertilizers for enhanced root development and flowering.

The chemical properties of the soil, particularly its cation exchange capacity (16.50 meq/100g), indicate a moderate ability to hold and exchange essential nutrients. The base saturation of 70% reflects a healthy presence of key cations like calcium, magnesium, and potassium, although potassium levels are relatively low and may need supplementation. The neutral pH (7.41) is ideal for most crops, ensuring that nutrients remain available to plants, while the low electrical conductivity (108.40 µS/cm) shows the soil is not saline, which is a positive sign for agricultural productivity.

4.2.3 Surface Water Quality

Water quality does not seem to be a critical issue for surface water, but the overuse of fertilizers and domestic wastewater are important threads. It is known to be a black market of all sorts of fertilizers, pesticides, insecticides, rodenticides, etc. sold at the borders with Viet Nam and applied indiscriminately by farmers to increase the numbers of crops a year.

The collected water samples were measured at the premises as well as at the laboratory, commissioned by Innovation Lab which is partner of Royal University of Phnom Penh (RUPP). Summary of the water quality testing is provided in Table below:

Figure 6: Location of surface water sample selection

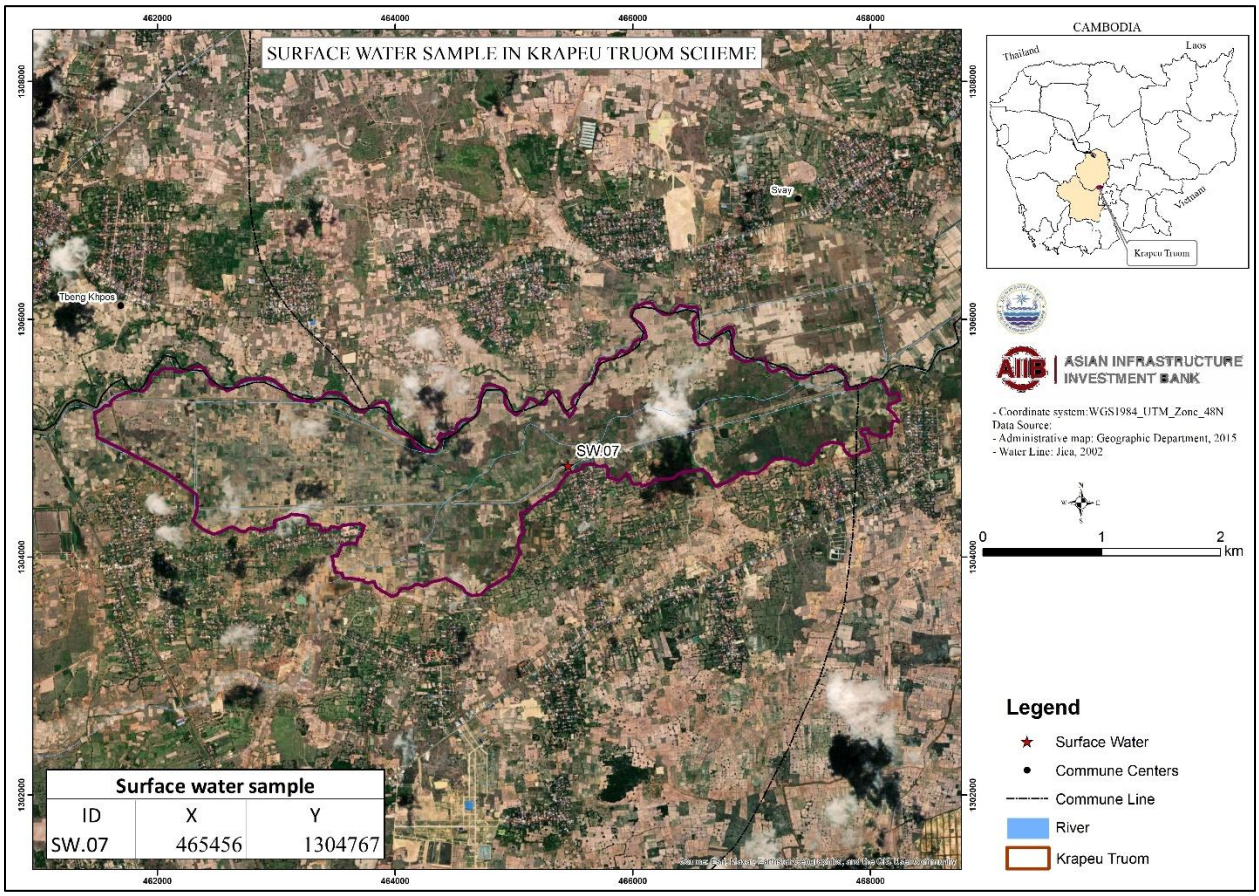


Table 7. Result of surface water quality

No	Parameter	Unit	SW.07	Standard (MoE)

				River	Lake and reservoir
1	Arsenic	mg/l	0.005	<0.01	<0.01
2	Cadmium	mg/l	0.001	<0.003	<0.003
3	Lead	mg/l	0.005	<0.01	<0.01
4	pH	-	6.53	6.5-8.5	6.5-8.5
5	Total dissolved solids	mg/l	83.43	<1000	<1000
6	Total suspended solids	mg/l	93	<100	<100
7	Total Nitrogen	mg/l	4.7	<3	<2
8	Total Phosphorus	mg/l	0.7	<0.25	<0.15
9	Total coliform	CFU/ 100mL	92,500	<1000	<1000
10	Electrical conductivity	µs/cm	167.1	500-1500	500-1500
11	Temperature	^{0}C	33.7	<45	<45
12	Dissolved oxygen	mg/l	6.84	>3	>4

(Source: Water Innovation Lab, 2024)

The surface water quality results for Krapeu Truom at SW.07 show a mix of acceptable and concerning findings when compared to the Cambodian Ministry of Environment's standards for rivers and lakes/reservoirs. Parameters such as arsenic (0.005 mg/l), cadmium (0.001 mg/l), lead (0.005 mg/l), pH (6.53), total dissolved solids (83.43 mg/l), electrical conductivity (167.1 µS/cm), and dissolved oxygen (6.84 mg/l) are within the acceptable limits, indicating generally good water quality with respect to these indicators. However, the water contains elevated levels of total nitrogen (4.7 mg/l) and total phosphorus (0.7 mg/l), which exceed the standards for both rivers and lakes/reservoirs. This suggests potential nutrient pollution that could lead to eutrophication, negatively affecting aquatic ecosystems. Of particular concern is the extremely high level of total coliform (92,500 CFU/100 mL), far exceeding the acceptable limit of 1,000 CFU/100 mL, indicating likely faecal or agricultural waste contamination, which poses significant health risks. While the temperature (33.7°C) is within limits, it is relatively high and could affect aquatic life if it increases further. Overall, while some parameters are within acceptable ranges, the elevated nutrient and coliform levels raise concerns about pollution and its potential impact on both the ecosystem and human health.

4.2.4 Groundwater Quality

Water testing is used to determine the existing groundwater quality at the project sites before construction and operation. GW3 is a type of open well with a depth of 10 meters and can only be used during the rainy season. The water level of the well is around two meters above the surface during the rainy season. The geographical positions and descriptions of the groundwater sampling points are given in Table 9. The results of the groundwater quality analysis are summarized in Table 9.

Table 8. Groundwater sampling locations

No.	Location				UTM	
	Province	District	Commune	Village	X	Y

GW3	Kampong Speu	Odongk	Veal Pung	Khnaor Ampil	465653	1303947

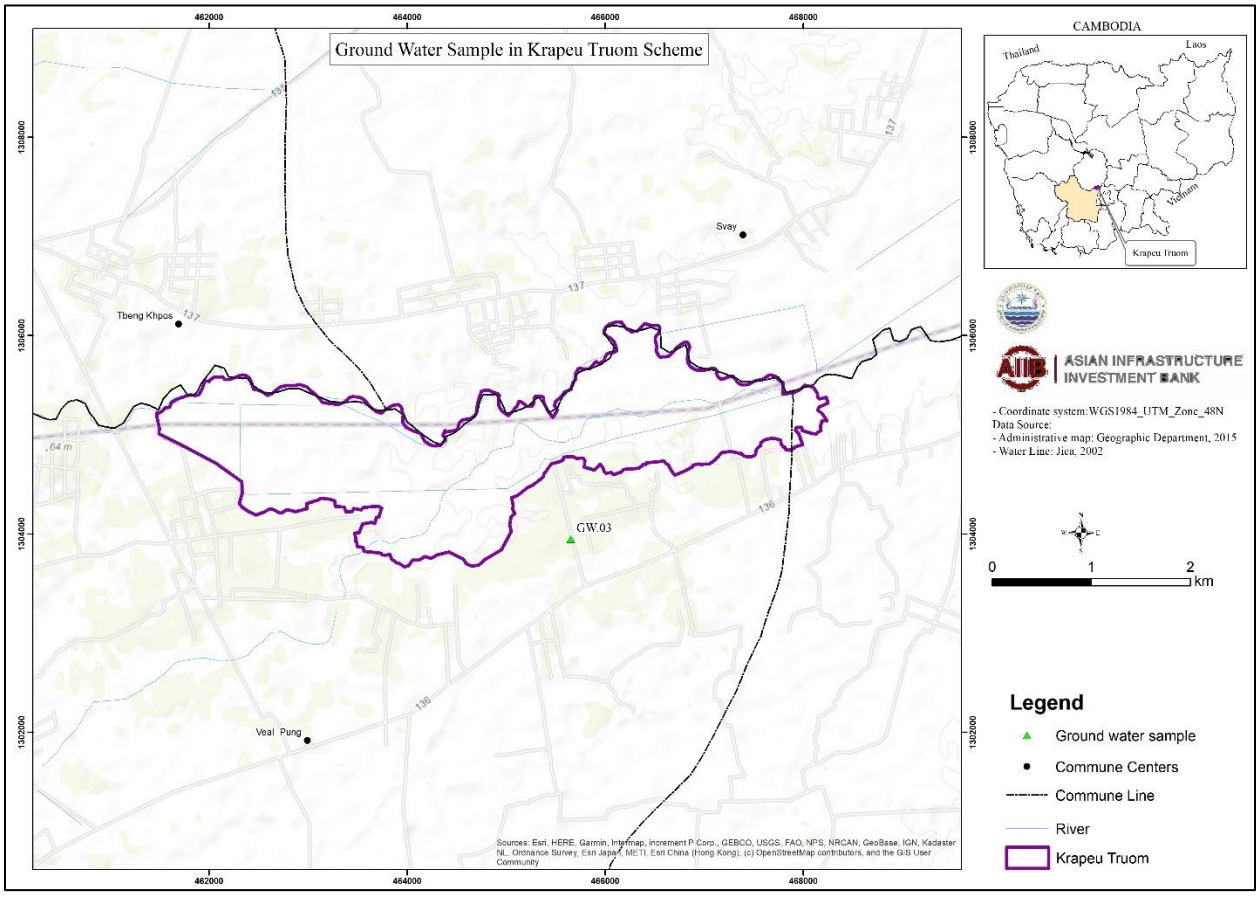
The selected samples were analysed and the results of the testing both at the field and at laboratory is provided in Table 10 below.

Table 9. Result of groundwater quality

No	Parameter	Unit	GW3	CDWQS
1	Arsenic	mg/l	0.005	0.05
2	Cadmium	mg/l	0.001	0.003
3	Lead	mg/l	0.005	0.01
4	pH	-	**6.48**	6.5-8.8
5	Total dissolved solids	mg/l	325.5	800
6	Total suspended solids	mg/l	3	-
7	Total Nitrogen	mg/l	21.5	-
8	Total Phosphorus	mg/l	2.2	-
9	Total coliform	CFU/ 100mL	1,200	0
10	Electrical conductivity	µs/cm	651.6	-
11	Temperature	^{0}C	30.5	-
12	Dissolved oxygen	mg/l	1.25	-

(Source: Water Innovation Lab, 2024)

Figure 7. Map of groundwater sampling location in Krapeu Truom sub-scheme



The groundwater quality results for the Krapeu Troum irrigation sub-scheme show that several key parameters are within safe limits according to the Cambodia Drinking Water Quality Standard (CDWQS). For instance, levels of arsenic (0.005 mg/l), cadmium (0.001 mg/l), and lead (0.005 mg/l) are well within the CDWQS thresholds, indicating that these heavy metals pose no significant health risks. The pH level of 6.5 is on the lower end of the acceptable range (6.5-8.8), meaning the water is slightly acidic but still suitable for consumption. Similarly, the total dissolved solids (TDS) of 58.12 mg/l are well below the limit of 800 mg/l, suggesting that the water has a low level of dissolved salts and minerals, which is generally favorable for drinking.

However, the total coliform count of 1,600 CFU/100mL far exceeds the CDWQS standard of 0 CFU/100mL, indicating significant fecal contamination. This is a serious concern, as the presence of coliform bacteria suggests that the groundwater is potentially unsafe for direct consumption without treatment, which could pose a risk to human health. Although total nitrogen (3.5 mg/l) and total phosphorus (0.29 mg/l) do not have specified CDWQS limits, their elevated levels indicate nutrient pollution, likely from agricultural runoff or other environmental sources, which could impact water quality over time.

Overall, while the groundwater meets the required standards for heavy metals and TDS, immediate action is necessary to address microbial contamination, such as implementing disinfection methods or boiling the water before use. Regular monitoring of nitrogen and phosphorus is recommended to

ensure long-term water quality, as nutrient pollution may degrade the ecosystem. The water is suitable for drinking only after proper treatment, with a focus on addressing the high coliform levels to ensure it is safe for consumption.

4.3 Biological Resources

4.3.1 Existing Species

A comprehensive biodiversity assessment, utilizing the Integrated Biodiversity Assessment Tool (IBAT) and a thorough literature review, the identified endangered and critically endangered species across reptiles, mammals, birds, fish, amphibians, plants, and fungi in Krapeu Truom sub-scheme is provided in Table below:

Table 10: Screening list of Endangered and Critically Endangered Species in Krapeu Truom

No.	Local Name	English Name	Scientific Name	IUCN Category	Yutasas
	Fish species				
2	ត្រីត្រសក់ក្រហម	Jullien's Golden Carp	*Probarbus jullieni*	CR	Yes
3	ត្រីចង្វាស្ទឹង	Leaping barb/Flying Minnow	*Laubuka caeruleostigmata*	EN	Yes

4.3.2 The EN and CR Species

Krapeu Truom is situated within the same river catchment area in the lower reaches, near the Tonle Sap's annual floodplain. The reported endangered species in this sub-scheme is the Isok barb/Jullien's Golden Carp *(Probarbus jullieni)* being seen once in 2022, approximately 500 meters downstream of the reservoir facility during a flooding event. The community reported that the species migrated upstream from the Tonle Sap during the flood season but became trapped in spillways. They added that if flooding is insufficient, fish populations decline, and rare species may no longer be present in the area.

Please see Annex 6 – Biodiversity Assessment and Action Plan for details.

4.4 Socio-Economic and Cultural Conditions

4.4.1 Demographic and Facilities

According to the commune database in 2023, the total number of households who are residing within and nearby the command area is 2,430 HH (out of which 379 HHs (16%) are female headed), giving the total population of 10,360 people (5,308 females). Moreover, the population are young with more than 63% of them are aging below 34 years old. More than half of the people (52%) completed education at primary school and below whereas those with secondary, high school, and higher education is only 25%, 8%, and 1%, respectively. It is noticeable that illiterate people have existed at 0.6%.

Overall, it is apparent that in the sub-schemes contain young population indicating its high potential in future development activities.

Table 11. Demographic information of the HH living within and the vicinity of the command areas

Parameters	Number	Parameters	Number
Overall		**Educational Level**	
Total HH	2,430	Kindergarten	13.2%
Female HH Head	379 (16%)	Primary school	52.1%
Total Population	10,360	Secondary school	24.8%
Female	5,308	High School	8.1%
Age		College/University	1.3%
<18 years old	36%	TVET	0.0%
18 – 34 years old	27%	Illiterate	0.6%
35 – 60 years old	25%		
> 60 years old	12%		

(Source: Ministry of Planning, Commune Database, 2023)

Energy access of the population within the target area was found to be high, giving its proportion at 98% access to electricity and only a minority of them continue using solar (2%). However, the sources of water for domestic consumption were high with 83% of them having access to water supply system while the rest continue using pump well, tube-well, pond, rainwater and river. A good sign for the people is how they are using water for drinking purposes which was found to be almost all using safe water for drinking (tape water 53%, filtered water 20%, and boiled water 26%). There is a concern, however, regarding the reliability of the tape water quality which may create significant impact on the people's health, if they are not properly monitored. Interestingly, almost all the people within the target areas own a toilet showing their understanding of the importance of water, sanitation and hygiene.

Table 12. Access to energy and water and sanitation facilities

Parameters	Percentage	Parameters	Percentage
Source of Energy		**Drinking Water**	
Electricity	98.1%	Tape water	53%
Battery	0.0%	Filtration	20%
Solar	1.9%	Boiled	26%
Biogas	0.0%		
Water Source for HH consumption		**Toilet**	
Tape water	83%	Pour Toilet	100%
Pump well	5%	Flush toilet	0%
Wells	2%	Total toilet	100%
Opened Well	0%		
Pond	2%		
Rainwater	5%		
River	2%		

(Source: Ministry of Planning, Commune Database, 2023)

4.4.2 Socio–economic Conditions of the Beneficiaries

Agriculture was reported as the main occupation of the population within the command areas. While business and service are the second highest proportion (23%). As for secondary occupations, full-time workers were dominant among the population while rice and crop production accounting for the second largest proportion (24%).

Table 13. Occupation of the HHs living within and the vicinity of the command areas

Parameters	Percentage	Parameters	Percentage
Main Occupation		**Secondary Occupation**	
Rice and crop production	25.08%	Rice and crop production	14.24%
Animal production	0.62%	Animal production	4.02%
Trade	3.72%	Trade	3.10%
Service	1.55%	Service	1.86%
Handicrafts	0.62%	Handicrafts	0.31%
Government staff	4.02%	Government staff	3.72%
Workers (full-time, private sector)	23.22%	Workers (full-time, private sector)	23.53%
Workers, (seasonal, private sector)	2.17%	Workers, (seasonal, private sector)	2.17%
Housewife	1.86%	Housewife	3.72%
Student	19.50%	Student	19.50%
Other	3.10%	Other	2.79%
No job	14.55%		

(Source: ESCIA Field Survey, 2024)

A significant proportion of the population with poor 1 & 2 is reported at 4%, indicating the level of economic condition of the areas while the proportion of the people with disability (PWD) is at 1.1%. The total migration is 13% and all of them only migrated within the country (13%).

Table 14. Migration and vulnerability of the people within the sub-schemes

Parameters	Percentage	Parameters	Percentage
Vulnerability		**Migration**	
Poor 1	1%	Inside the country	13%
Poor 2	3%	Out of the country	0%
Total	**4%**	**Total**	**13%**
Disable person	1.1%		
Old people	0.0%		
Orphan	0.1%		
Total	**1.2%**		

(Source: ESCIA Field Survey, 2024, Ministry of Planning, Commune Database, 2023)

Semi-permanent houses are the most dominated shelter of the people comprising of 49% of the total settlement. Wooden houses with thatched roof are the second most popular (36%) while the rest belong to one or more floor brick wall and temporary house. Interestingly, 3% of them live in temporary houses. The assets that people own the most are Television (81%), followed by motorbikes (71%), and bicycle (39%), and power tiller (11%) while the rest are in small proportion.

Table 15. Houses and Assets of the HHs within the Sub-Schemes

Parameters	Percentage	Parameters	Percentage
Assets		**Type of Houses**	
HH with Tractor	0.1%	One floor or more/brick wall	11.94%
Power Tiller	11%	Semi-permanent	49.25%
HH with Rice Harvester	0.0%	Wooden house, thatched	35.82%
Threshing Machine	0.2%	Temporary houses	2.99%
Harvest and Threshing Machine	0%		
Mobile rice mill	0.2%		
Car	6%		
Other Machinery	0%		
Motorbike	71%		
Tricycle	1%		
Bike cycle	39%		
Boat	0%		
TV	81%		

(Source: ESCIA Field Survey, 2024, Ministry of Planning, Commune Database, 2023)

4.4.3 Gender

4.4.3.1 Labor Division

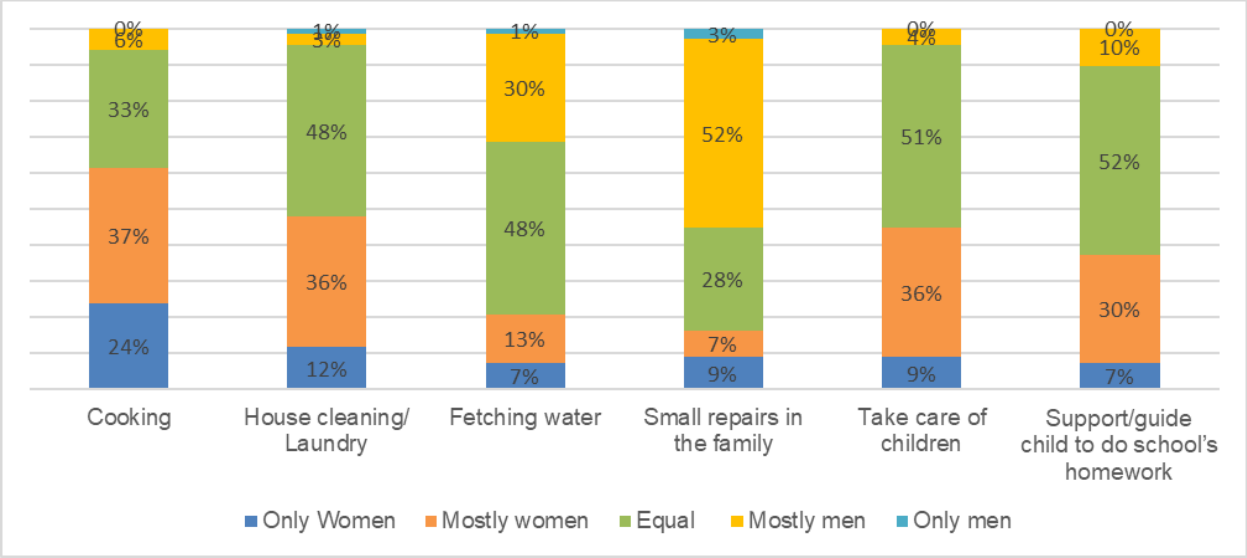
CAISAR Gender Assessment and Social Inclusion Plan reported that men spend on average of 59.4% of their time for farming whereas women spend only 40.5%. In traditional farming context, men involve the most during cultivation stage while women are more engaged in the later production. Heavy duty tasks such as land preparation are designated to men while seedling preparation and weeding are commonly assigned to women. Transplanting, uprooting, harvesting, and marketing are generally shared by both. However, the practices have been changed lately due to the presence of mechanization where land preparation, harvesting and threshing have been replaced by machinery.[3]

Coming to household chores; women handle 90% of the workload. During the COVID-19 outbreak, women spent even more time on domestic and caregiving tasks. Elderly family members bear the full responsibility for raising grandchildren when their mothers have migrated. In the project area, similarly, in families where women work in nearby garment factories or migrate for paid employment, domestic duties are often shifted to young girls and the elderly. [5] However, the ESCIA field survey showed that house cleaning, fetching water, child caring and schooling are mainly at the hand both men and

[3] CAISARP (2024). Gender Assessment and Gender Action & Social Inclusion Plan. CAISAR Project. MoWRAM.

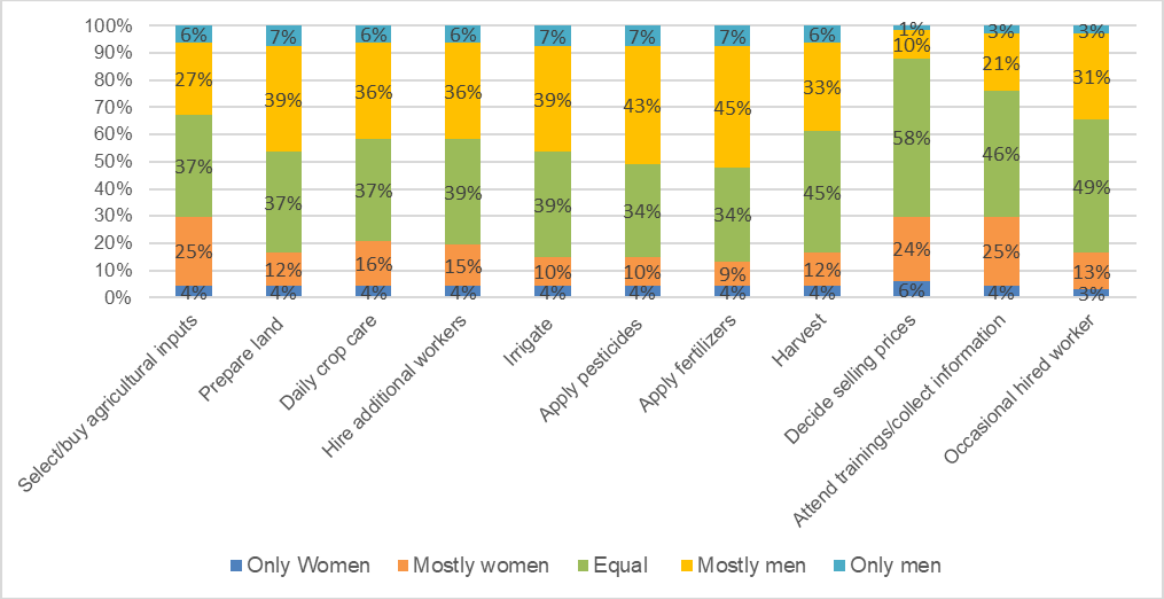
women, except cooking mostly hand by women while repairing in the household, men involve the most (Figure 11).

Figure 8. Division of Roles in Household Chores (n=67)



(Source: ESCIA Field Survey, 2024)

Figure 9. Share of Roles in Crop Cultivation (n=67)

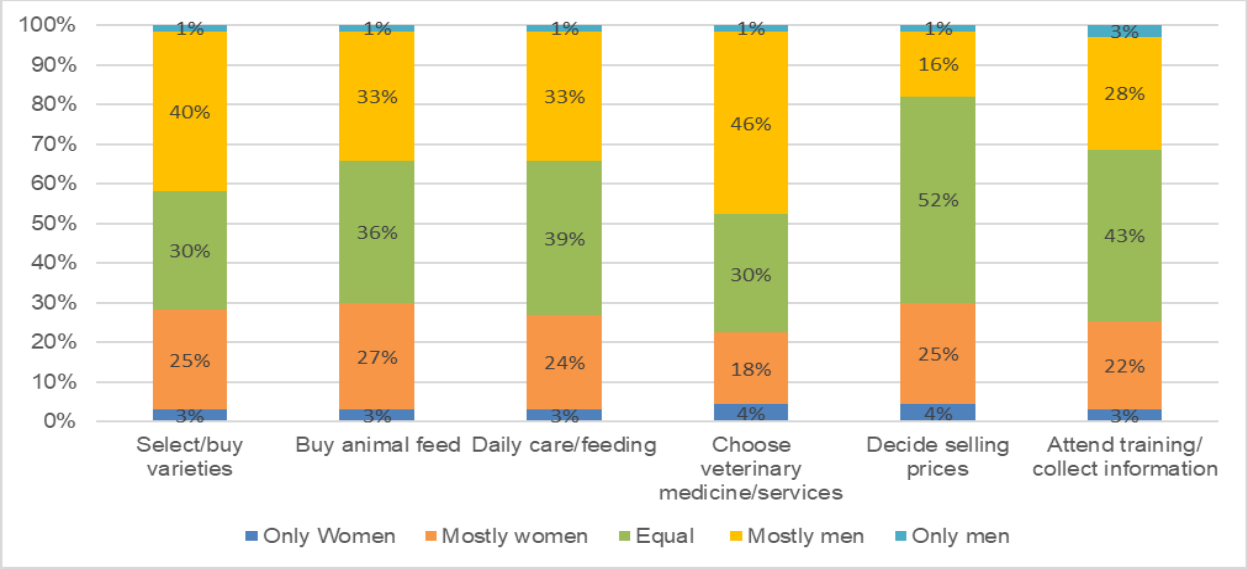


(Source: ESCIA Field Survey, 2024)

In crop production, the majority of tasks, particularly during the production phase, were found to be dominated both men and women except during land preparation, pesticide and fertilizer applied mostly hand by men (Figure 12).

In animal production, the distribution of labour is still found to be equally involved both male and female almost at all stage exception choose varieties and selecting veterinary medicine mostly response by male (Figure 13).

Figure 10. Share of roles in Animal Husbandry (n=67)



(Source: ESCIA Field Survey, 2024)

4.4.3.2 Income

The CAISAR Gender Assessment and Social Inclusion Plan revealed notable findings regarding income differences by gender. On an individual level, the average monthly income for female household members is $121.4 (n=238), which is lower than the $166.6 earned by male members (n=366), showing a statistically significant income gap of $45.2. However, at the household level, there is no significant difference in average income between female-headed and male-headed households, with a small mean difference of $17.3. Nationally, 48% of married men (aged 15–49) reported making joint decisions with their wives on income use, 46% said their wives mainly make these decisions, and 6% said they decide alone. Additionally, 97% of married women (aged 15–49) who earn cash from employment participate in decisions about their earnings, with 63% making these decisions mainly on their own.

4.4.3.3 Decision Making

Regarding decision-making, the matters related to children, such as education, childcare, and marriage, are typically decided by both husband and wife. However, a significant number of households have women as the sole decision-makers on child-related issues. When it comes to daily livelihoods, decisions such as household expenses, sales of home-produced goods, and visiting friends or family are usually made jointly. Still, a notable portion of respondents indicated that women alone make decisions regarding their own livelihoods, family expenses, attending trainings, and similar matters. While women tend to take the lead on child and livelihood issues, decisions concerning agricultural activities, like cultivation and animal husbandry, are mostly handled by men. This is largely

due to the physically demanding and sometimes hazardous nature of agricultural work, such as pesticide application.

4.4.4 Agricultural Production

4.4.4.1 Rice Production

In Kropeau Troum, most farmers cultivate paddy rice during the wet season, while some areas grow watermelon, wind gourd, and cucumber in the dry season between March and May. The average land size for rice production ranges from 0.3 to 1 hectare. Common rice varieties grown include Neang Menh, Phka Mlis, Reang Chey, and Phka Rumduol. Farmers typically use about 120 kg of rice seed per hectare during the wet season, with no rice production in the dry season due to water scarcity. Most seeds are self-produced, and farmers only purchase additional supplies when shortages arise.

Fertilizer use during the wet season averages 100 kg of chemical fertilizer and 200 kg of compost per hectare, while pesticide application is not common. Labor for rice farming is primarily household-based, but external labor is hired for tasks such as soil preparation, harvesting, and transporting rice. The average rice yield during the wet season is 4.25 tons per hectare, but production faces significant challenges due to damaged irrigation gates, which lead to water shortages, along with pests like the walker insect and weed infestations.

After harvesting, straw is typically kept for cow feed, sold, or left in the field for 2-3 months before being either burned or ploughed under. The average cost of production ranges from 1,500,000 to 2,000,000 riel, approximately 400 USD per hectare. Farmers in the area have received training on water consumption management, techniques for rice seed storage and use, as well as proper fertilizer and pesticide application techniques.

Table 16. Rice production during wet and dry season

Parameters	Percentage	Parameters	Percentage
Wet season		**Dry season**	
Land size (m^2)	6,816	Land size (m^2)	17,000
Yield (kg/year)	1,838	Yield (kg/year)	6,500
Income (USD/year)	526	Income (USD/year)	1,625

(Source: ESCIA Field Survey, 2024)

4.4.4.2 Vegetable Production

The average land size for vegetable cultivation ranges from 200 to 2,000 square meters. During the dry season, watermelon fields are situated near Stung Krang Ponley, with water accessed through short-distance pumping. In the wet season, some farmers relocate their watermelon cultivation to upland areas, relying on rainwater for irrigation. Rice fields used for watermelon in the dry season are converted back to rice paddies for the wet season. Farmers practice both chemical and organic cultivation methods. Water sources include rainwater, ponds, canals, rivers, and tap water. There are no agricultural associations in the area. Expenditures for vegetable production, including seeds, fertilizers (both chemical and manure), labor, and irrigation (pump rentals), range from USD 50 to USD 500. The average income from vegetable sales is around USD 1,000.

Vegetables are sold for household consumption and at local markets. Challenges faced include insect pests, diseases, water shortages, inadequate planting techniques, lack of materials, high temperatures, low prices, and climate change. Farmers have received agricultural services such as seed provision from the provincial department, market information, and farm demonstrations on planting techniques.

Table 17. Vegetable production during wet and dry season

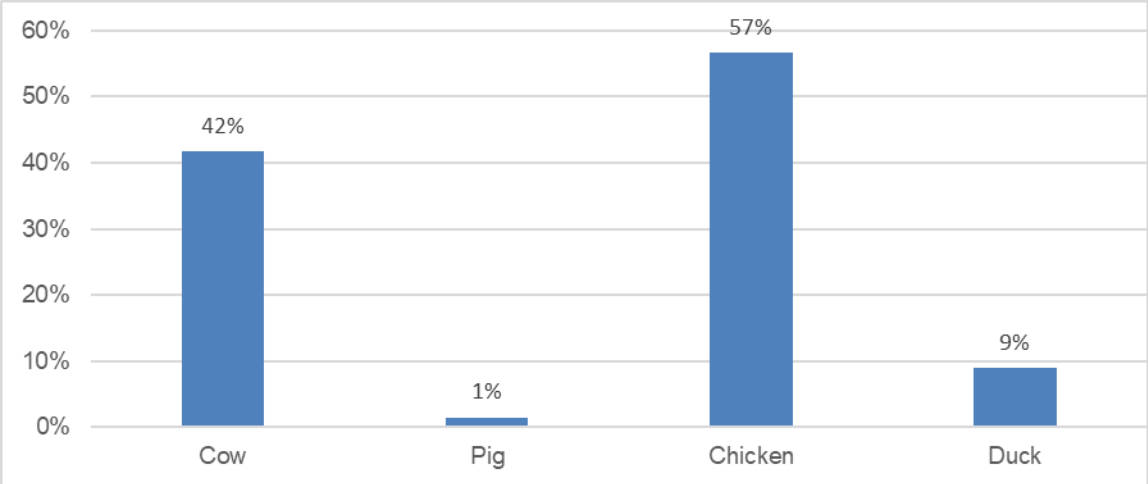
Parameters	Percentage	Parameters	Percentage
Wet season		**Dry season**	
Land size (m^2)	150	Land size (m^2)	575
Yield (kg/year)	750	Yield (kg/year)	10,806
Income (USD/year)	750	Income (USD/year)	7,429

(Source: ESCIA Field Survey, 2024)

4.4.4.3 Animal Production

In the Krapeu Truom, a diverse range of animal production activities is prevalent among local households. Cattle farming is the most common, with 42% of households raising cows. Pig farming is practiced by 1% of households. Chicken farming is the most widespread, with 57% of households involved in raising chickens, reflecting their significant role in the local economy and diet. Ducks are the least common among the livestock options, with just 9% of households raising them. This distribution highlights the varied livestock practices within the area, with a strong emphasis on poultry farming and a notable presence of cattle and buffalo farming.

Figure 11. Type of animal in Krapeu Truom command area



(Source: ESCIA Field Survey, 2024)

Please see Annex 6 – Biodiversity Assessment and Management Plan for details.

5. ENVIRONMENTAL & SOCIAL RISKS, IMPACTS, AND MITIGATION

In this section, the E&S risks and impacts (that potentially arise during activity implementation and operationalization) are identified, analysed, and evaluated at project level — with regards to the nature, scope, scale, and the potential extent of activity impacts — through classification of such risks and impacts as direct, indirect, and cumulative. The assessment of E&S risks and impacts in this chapter is based on the following grounds that is fundamental to proposing measures to avoid, minimize, and mitigate for the impacts in the next chapter:

Project's original technical reports

- Feasibility Studies (August 2023)
- Feasibility Studies (updated by November 2023).
- Additional Pre–Feasibility for Krapeu Truom Sub–scheme.
- Environmental and Social Management Framework – ESMF (Updated by September 2024)
- IBAT reports for Krapeu Truom.

Stakeholder Consultations (national, provincial, district, commune, and village levels)

- Community Meetings
- Focus Group Discussions
- Key Information Interview.

Field observation, using

- Transect walks.
- Drones (for E&S screening and biodiversity assessment)

External technical reports

- Statistical reports/database.
- Publications and Technical Reports from national and internation institutions.

Table 18: Environmental Risks, Impacts, and proposed Mitigation Measures

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
BEFORE CONSTRUCTION						
UNEXPLODED ORDNANCES		**Comp 1,2**				
Although effort have been made to demine across the country, mortar shells, aerial bombs, and other unexploded ordnance may be found within the subproject area. Some demining operations have been carried out at shallow depths, and UXO maps have been generated but it is not known if there is UXO that is located in proximity of the structures where structural upgrading would be made. Of particular concern is the hazard posed by unexploded ordinance left during the war, particularly in area where deep excavation is required.	Construction/ Rehabilication of canals, farm roads, and relevant facilities that involve earthworks, soil excavation, river dreding, and so forth.	• Activity 1.4.1 • Activity 1.4.2 • Activity 1.4.3 • Activity 2.1.1 • Activity 2.1.2 • Activity 2.2.2	Residents, construction workers, animals, and any objectives nearby **High**	Based on the consultation with local authorities and community people, there have been no reported incidents of mines or unexploded ordnance (UXO) within the command areas. However, the risk remains due to the country's long history of civil war, with mine clearance efforts often limited to surface-level areas. As a result, construction activities involving deeper excavation could potentially expose mines or UXO, leading to explosion. This risk more likely to occur within the command area and at location where physical excavations are carried out.	**Nature & Duration:** short term **Extent:** Direct **Scale:** local **Magnitude:** Minor **Likelihood:** Likely **Inherent Risk:** Moderate **Residual risk:** Negligible	• In case of finding the suspected objects during any work, UXOs must be followed • A UXO clearance plan should be developed as part of site-specific ESCMP and is implemented before commencing project activity. • Conduct assessment of UXO risks before site clearance. UXO screening/assessment will be carried out by certified UXO experts before any physical/construction activities, including mobilization of contractors to construction site, are allowed. • In case UXOs are found by certified experts during on-site screening, removal of UXO will be carried out by certified experts. • A UXO clearance certificate shall be obtained from related authority for each subproject prior to commencing any subproject activities • As part of site-specific ESMP, conduct training and awareness activities for local community with regards to UXO risks and chance finds.
DURING CONSTRUCTION						
ENVIRONMENTAL POLLUTION		**Comp 1,2**				
Noise: Earthmoving activities and operation of machineries at construction sites will generate dusts and exhaust fumes. Construction activities, operation of vehicular movement, excavation machineries, concrete	Rehabilitation of irrigation canal and farm roads	• Activity 1.4.3 • Activity 2.1.2 • Activity 2.2.2	Nearby residents Construction workers **Minor**	There are limited large scale and heavy infrastructure construction being planned under the project within the areas, except the construction of small-scale hydraulic structures of the irrigation system. In addition, the larger ones are located	**Nature & Duration:** Temporary **Extent:** Direct **Scale:** local **Magnitude:** Minor **Likelihood:** Likely **Inherent Risk:** Moderate **Residual risk:** Minor	• Right before the construction, conduct noise testing at the sensitive locations as per the detail engineering design comparing to the IFC EHS Guideline • Avoid night-time construction in populated/village areas. • Minimize project transportation through community areas where possible.

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
mixing, and other construction activities will generate noise and vibration and will be a nuisance to workers and residents near the site. Noise may be generated from workers' camp, particularly during living activities or entertainment at nighttime, or due to certain maintenance /repair of equipment, machinery, vehicles.				outside the residential areas. In this regard, they are unlikely to affect community people as the duration is short while the people along the national road scheme will be possibly heard the traffic noise along the road instead.		• Ensure proper maintenance and proper operation of construction machinery to minimize noise generation. • Where possible, maintain existing trees, bushes, vegetated areas, to prevent part of sound (that may be generated from construction site, vehicle, operating heavy equipment) from reaching nearby residential areas. • No noisy construction-related activities will be carried out from 21:00 hours to 06:00 hours along residential areas, hospitals, schools and other sensitive receptors. • Noisy construction activities will be avoided during religious or cultural events near the subproject • All construction equipment and vehicles must be well maintained, regularly inspected for noise emissions, and shall be fitted with effective muffler and other appropriate noise suppression equipment consistent with applicable national and local regulations. • Use only vehicles and equipment that are registered and have necessary permits. Truck drivers and equipment operators should avoid, as much as possible, the use of horns in densely populated areas and where there are other sensitive receptors found such as schools, temples, hospitals, etc. • Impose speed limits on construction vehicles to minimize noise emission along areas where sensitive receptors are located (houses, schools, temples, hospitals, etc. • Provide temporary noise barriers (3–5-meter-high barrier can reduce 5–10 dB(A)), as necessary, if site works will generate high noise levels that could

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
						disturb nearby households, hospital, school and other sensitive receptors. • Restrict use of vibrating rollers and operation of heavy equipment near sensitive structures.
Air pollution: Dust will be generated by transportation of material, clearing, grading, excavation, levelling, truck hauling, stockpiling, waste disposal, access road rehabilitation. In addition, the emission is also expected from machineries and vehicles, especially during dry season.	Transportation of materials, clearing, grading, excavation, levelling, truck hauling, stockpiling, waste disposal, access road rehabilitation	• Activity 1.4.3 • Activity 2.1.2 • Activity 2.2.2	Nearby residents Construction workers **Minor**	These activities generate dust and particulate matter (PM10 and PM2.5) from soil disturbances, stockpiles, and road works, leading to localized air pollution that can affect respiratory health. Exhaust emissions from trucks and heavy machinery release pollutants such as nitrogen oxides (NOx), carbon monoxide (CO), sulphur dioxide (SO2), and volatile organic compounds (VOCs), contributing to smog formation and greenhouse gas emissions. Additionally, waste disposal, particularly through burning, can release harmful pollutants into the air, further degrading air quality. However, the level of generation is minimal as the extent of the release is gradually moved from place to place and short in duration.	**Nature & Duration:** Short and long term **Extent:** Direct **Scale:** local **Magnitude:** Minor **Likelihood:** Unlikely **Inherent Risk**: Moderate **Residual risk:** Minor	• Right before the construction, conduct ambient air quality testing at the sensitive locations as per the detail engineering design comparing to the IFC EHS Guideline • Spray or sprinkle water on work surfaces regularly in windy and dry weather, when necessary. • Avoid open burning of debris, cut vegetation (trees, undergrowth) or construction waste materials. • Reduce the operation hours of generators, machines, equipment, and vehicles as much as possible and control vehicle speed. • Ensure regular maintenance of generators, machines, equipment, and vehicles used at project site. • To protect against dust and fumes, spray water onto the ground. • Construction equipment is maintained to a good standard and conduct immediate repairs of any malfunctioning construction vehicles and equipment. • Equipment and vehicles not in use should be switched off. • Machinery and vehicles causing excessive pollution (e.g., visible smoke) will be banned from construction sites. • All construction equipment and vehicles shall have valid certifications indicating compliance with vehicle emission standards. • The site of concrete mixing plants, crushing plants, quarries and other facilities that cause high dust and/or gaseous emissions should be at least

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
						500 m from settlements and other sensitive receptors (schools, hospitals, etc.). • Tightly cover trucks transporting construction materials (sand, soil, cement, gravel, etc.) to avoid spills and dust emission.
Water pollution • Surface water quality reduction can occur due to construction, especially the earthwork, leakage of oils and chemical materials • Underground water quality reduction due to construction activities	Dredging and excavation activities, often required for the rehabilitation and upgrading of irrigation infrastructure in river systems	• Activity 1.4.3 • Activity 2.1.2 • Activity 2.2.2	Nearby residents Construction workers **Minor**	The small repair of dam, and canal rehabilitation, can significantly impact water quality, particularly through increased sedimentation. Disturbed soil from excavation can enter water bodies, potentially polluting domestic water sources as sediment is carried downstream when water is released from rehabilitated reservoirs or canals. No major construction or dredging being anticipated; therefore, the impacts are likely to be limited both on surface and groundwater.	**Nature & Duration:** Short term **Extent:** Direct & indirect **Scale:** Local & regional **Magnitude:** Minor **Likelihood:** Unlikely **Likelihood:** Unlikely **Inherent Risk:** Moderate **Residual risk:** Minor	• Construction diversion control should be prepared to avoid water flow, and spreading of all pollutants caused by the construction. • Do not fill up canals and creeks at the construction site. In case filling of local drainage system is necessary, consultation with local authorities shall be undertaken and their permission obtained beforehand. An alternative drainage shall be established before the existing canal is filled up. • Prohibit placement of construction materials, waste storage areas or equipment in or near drainage channels and water courses. • Discharge of oily wastewater, fuel, hazardous substances and wastes, and untreated sewage to watercourses/canals and on the ground/soil is prohibited. • Provide adequate drainage at the construction sites and other project areas to avoid flooding of surrounding areas and minimize flow obstruction of existing watercourses. • Include in engineering drawing the construction of retaining structures such as gabion baskets, riprap, etc. for riverbank protection. • Obtain required permits indicating water sources and permissible volumes • Maintain communication with local communities during construction stage to ensure that local water users provide timely feedback on water

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
						quality, if any, during construction process. • Conduct water quality testing from upstream and downstream of the river system for quality test during and after construction to compare with the baseline and the IFC standard for monitoring purposes.
Soil pollution/ quality reduction: Leakage of oils, and chemicals used for machinery and construction process at farming land and construction sites. The fuel storage tanks in construction sites do not provide suitable storage places to contain accidental spills that affect soil quality. .	The activities affecting soil quality during this stage include dredging and the leakage of oils used for machinery and construction processes at construction sites.	• Activity 1.4.3 • Activity 2.1.2 • Activity 2.2.2	Nearby residents Construction workers/ Minor	Since excavation of the soil is at a small scale, the impact may be minimal. There are still oil leakage from equipment which can significantly impact soil quality. Oil introduces harmful contaminants like hydrocarbons and heavy metals, reducing soil fertility, disrupting microbial activity, and posing risks to nearby water bodies through runoff. In addition, excavation disturbs soil structure, increasing erosion and reducing its ability to retain water and nutrients, which can decrease agricultural productivity.	**Nature & Duration**: Short term **Extent:** Direct **Scale:** Local **Magnitude:** Moderate **Likelihood:** Likely **Inherent Risk:** Moderate **Residual risk:** Minor	• During Construction • Scheduling construction activities during the dry season as much as possible. • Store fuels, oils, and chemicals safely in areas on an impermeable surface with proper containment berms. Spillage of oil and chemicals must be handled immediately to prevent infiltration. • Cover all restored areas with topsoil and re-vegetate (plant grass, fast-growing plants/trees) construction areas quickly once work is completed. • Construction diversion control should be prepared to avoid water flow, and spreading of all pollutants caused by the construction.
Solid waste: During construction, waste of various kinds will be generated including solid wastes, hazardous wastes, and domestic solid waste (at workers' camp site). Solid waste may include surplus excavated materials, used lumber for trenching works, waste generated from demolition of existing camp, structures, construction debris, and so forth.		• Activity 1.4.3 • Activity 2.1.2 • Activity 2.2.2	Nearby residents Construction workers Soil in the rivers and farmland **High**	The rehabilitation and upgrading construction for existing irrigation infrastructure in command areas often involves the establishment of temporary worker camps, the use of heavy machinery like trucks and excavators, and the generation of various types of waste. Solid waste generated during construction may include surplus excavated materials, used lumber	**Nature & Duration:** Short and long term **Extent:** Direct **Scale:** Local **Magnitude:** Moderate **Likelihood:** Unlikely **Inherent Risk:** Moderate **Residual risk:** Minor	**For hazardous waste in agricultural production** • Crop residue: straw and stub should be collected for use as animal feed or for other purpose such as for mushroom growing, or for sale, or reuse for other farming purpose (e.g. incorporating into soil to improve soil fertility) • Empty pesticide containers: collected and kept appropriately as per recommendation in IPM good practices. • Never through and leave empty pesticide contain in the field which

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
				from trenching works, debris from the demolition of existing camp structures, and other construction remnants. Domestic waste generated by construction workers at the construction site, worker camps, and other facilities can also contribute to environmental pollution. While the direct impact of this waste is often localized to the construction site and camps, improper management can lead to further environmental damage. Hazardous waste, such as oil and chemicals used in construction operations, can pose a threat to the environment. If not handled carefully, these hazardous materials can leak into the soil, causing contamination and potentially contaminating nearby water bodies.		may contaminate soil and surface water which may affect aquatic animals and even humans. **For non-hazardous waste** • Reduce, recycle, and reuse waste [e.g. plastic wastes, electronic waste, agricultural waste (natural, animal faces for later use as manure, plant waste)] wherever and whenever possible. • Latrines must be built at construction sites and camp sites for appropriate domestic waste management. **For dredging materials** • Use or reuse the dredge material on properties with a residential or recreational use (dredging material, if planned for reuse, will be subject to testing to ensure the material is safe for reuse). • Prepare short-term placement of dredge material during off-loading or re- handling activities. The quantity of dredge material to be stored at the site must not exceed the quantity of material that can reasonably be managed at the site during the construction periods • Consult properly regarding the selection and design of the waste disposal locations and storage facilities • Dewatering the dredge material prior to reuse of the materials
Domestic waste: Food waste (bone, and meat waste and vegetables), paper, glass, metals, plastics, textiles, etc. being disposed by in-migrant labourers.		• Activity 1.4.3 • Activity 2.1.2 • Activity 2.2.2	Nearby residents Construction workers Water body along construction site		**Nature & Duration:** Short and long term **Extent:** Direct **Scale:** Local **Magnitude:** Moderate **Likelihood:** Unlikely	• Implement waste management plan with appropriate dump sites

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
			Moderate		**Inherent Risk**: Moderate **Residual risk:** Minor	
Wastewater: • Hazardous wastewater, such as oil or fuel, chemical used for machinery and construction process at the construction site. • Domestic wastewater comes from workers/staff's water consumption daily.			Nearby residents Construction workers Water body along construction site **Moderate**		**Nature & Duration:** Short and long term **Extent:** Direct **Scale:** local **Magnitude:** Moderate **Likelihood:** Likely **Inherent Risk**: Moderate **Residual risk:** Minor	• Segregate waste (e.g. hazardous and non-hazardous), collect, store and transport waste to designated waste disposal sites. **For hazardous waste in construction** • Setting up a systematic waste management and chain of custody system considering waste reduction at source, recycling, temporary storage, transport, and final disposal. • Develop procedures for the safe collection, storage, transport, and disposal of project hazardous waste at licensing/permitting site. • Never dispose of used oil on the ground and in water courses as it can contaminate soil and groundwater (including drinking water supplies). • Have a diluted wash wastewater disposal ground tank with internal water proofing layer to protect leakage. • Store fuel and hazardous substances and wastes on bonded paved areas with roofs and interceptor traps so that accidental spills do not contaminate the environment. If spills or leaks do occur, undertake immediate clean up. • Train relevant construction personnel in handling of fuels and other hazardous substances as well as spill control and clean-up procedures. • Ensure availability of spill clean-up materials (i.e. absorbent pads, etc.) specifically designed for petroleum products and other hazardous substances where such materials are being stored. • Segregate hazardous wastes (oily wastes, used batteries, fuel drums)

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
						and ensure that storage, transport and disposal shall not cause pollution and shall be undertaken consistent with national and local regulations. • Store waste oil, lubricant and other hazardous materials and waste in tightly sealed containers to avoid contamination of soil and water resources. • Ensure all storage containers of hazardous substances and wastes are in good condition with proper labelling. • Regularly check containers for leakage and undertake necessary repair or replacement. • Store hazardous materials above flood level. • Storage areas for fuel, oil, lubricant, bitumen and other hazardous substances will be located at least 100 m away from any watercourses. • Storage, transport and disposal of hazardous wastes, including spilled wastes, shall be consistent with national and local regulations. • Wherever possible, refuelling will be carried out at a fuel storage area. • Refuelling shall not be permitted within or adjacent to watercourses. • Where a significant amount of oily wastewater or spill/leakage of oil and grease may occur (i.e. equipment maintenance areas), drainage leading to an oil- water separator shall be provided for treatment of wastewater. The oil-water separator shall be regularly skimmed of oil and maintained to ensure efficiency. • Vehicle maintenance and refuelling will be confined to designated areas in construction sites designed to contain spilled lubricants and fuel. • Adequate precautions will be taken to prevent oil/lubricant/hydrocarbon

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
						contamination of channel beds. Spillage if any will be immediately cleared with utmost caution to leave no traces. • All areas intended for storage of hazardous materials will be quarantined and provided with adequate facilities (i.e. firefighting equipment, sorbent pads, etc.) to combat emergency situations complying with all the applicable statutory stipulation. • For canal rehabilitation works, the project will have proper sludge handling and management procedures to manage the excavated sludge materials and to prevent harmful exposure to workers and surrounding communities.
BIODIVERSITY		*Comp 1,2*				
Habitat Loss and Fragmentation: Conversion of micro-forests or vegetations in wetlands at micro or large may be needed for canal construction can lead to broken down of the habitat. **Habitat fragmentation:** The remaining natural habitats may become isolated patches, making it difficult for species to migrate, find mates, and maintain healthy populations.	Rehabilitation of irrigation canal and farm roads	• Activity 2.1.2 • Activity 2.2.2	Terrestrial species **Moderate**	Prior to construction, there will be clearance of bushes, forest or vegetations along the rehabilitated canals, and access road. Other activities such as river dredging and rehabilitation activities, as well as dam construction and upgrading which will be potentially led to habitat loss and fragmentation. Thes project involve altering the natural course of rivers and waterways, which can disrupt existing aquatic ecosystems. Dredging activities can remove valuable aquatic vegetation and disturb sediment beds, destroying habitats for fish and other aquatic organisms. The	**Nature & Duration:** Short and long term **Extent:** Direct & indirect **Scale:** Local and regional **Magnitude:** High **Likelihood:** Likely **Inherent Risk:** Moderate **Residual risk:** Minor	• Implement Biodiversity Action Plan

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
				construction of culverts or water structures can create barriers that isolate upstream and downstream populations, limiting their access to food and breeding grounds. Additionally, these projects can introduce pollutants and sedimentation into the water, further degrading habitat quality and impacting biodiversity. But these impacts are likely to be considered high due to biodiversity assessment, in that there is rich of biodiversity hot spot even the surrounding area is mostly paddy fields.		
Loss of Biodiversity Species Decline: Habitat loss and degradation can lead to declines in species populations in the long run, particularly those already classified as critically endangered. **Disruption of Ecosystem Services:** The loss of biodiversity can disrupt ecosystem services such as water purification, flood control, and carbon storage, slightly contributing to the long-term impact.	Rehabilitation of irrigation canal and farm roads	• Activity 2.1.2 • Activity 2.2.2	Aquatic and terrestrial species **Moderate**	While project activities in the construction phase like river dredging and canal rehabilitation can have some short-term impacts on fauna and flora, these effects are generally not considered serious. The interventions are primarily focused on restoring existing irrigation systems, and the affected areas are not known for high biodiversity. The noise from construction activities may temporarily disturb wildlife, but it is unlikely to cause long-term harm. The movement of aquatic biodiversity might be restricted due to the cut-off of waterways in certain sub-schemes. Overall, the fauna and flora effects of	**Nature & Duration:** Short and long term **Extent:** Direct & indirect **Scale:** local and regional **Magnitude:** Major **Likelihood:** Possibly **Inherent Risk:** Moderate **Residual risk:** Minor	• Implement Biodiversity Action Plan • Apply Find Chance Procedure

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
				these projects are anticipated to be minimal and reversible.		
Hunting, trading, and consumption of wildlife: The influx of a new labour force can increase demand for exotic local foods, including wildlife and endangered species, which are often seen as interesting and delicious. This may be done for relaxation or belief that wildlife is tasty or making people healthy.	Rehabilitation of irrigation canal and farm roads	• Activity 1.4.3 • Activity 2.1.2 • Activity 2.2.2	Aquatic and terrestrial species **High**	The risks can be quite severe when there is a large workforce or where there is also a risk to the aquatic endangered species. This demand drives illegal hunting and trading, threatening biodiversity and destabilizing ecosystems. The rarity of these species raises their market value, encouraging unsustainable practices that can lead to extinction. Additionally, consuming wild animals poses health risks due to zoonotic diseases and can harm local economies by depleting valuable fish stocks, affecting communities reliant on these resources. It is likely to occur not only at the local level but at the regional level as well and the impact is severe and irreversible.	**Nature & Duration:** Short and long term **Extent:** Induced **Scale:** local **Magnitude:** Moderate **Likelihood:** Possibly **Inherent Risk:** Moderate **Residual risk:** Minor	• Implement Biodiversity Action Plan
• **Loss of fauna and flora** Construction activities, including the rehabilitation of irrigation canals and farm roads, can lead to the clearing of vegetation and the disruption of natural habitats. This is particularly concerning areas like the Lum Hach command area, where the project might involve constructing a canal across community forestry,	Construction of canals and roads, especially across community forestry	• Activity 2.1.2 Activity 2.2.2	Various species, particularly those dependent on forests and wetlands. **Minimal**	Lead to habitat loss and fragmentation, directly impacting fauna and flora. This impact could be minimal since the area has no significant forestry area. The construction of canals and roads may require clear micro-forest, leading to habitat loss and fragmentation. This is especially concerning given the presence of	**Nature & Duration:** long term **Extent:** Direct **Scale:** local **Magnitude:** Moderate **Likelihood:** likely **Inherent Risk:** High **Residual risk:** Minor	• Construction activities should avoid clearing vegetation outside the designated project area. Existing trees and vegetation should be protected. • Measures should be implemented to prevent sedimentation in water bodies and mitigate downstream impacts from erosion. • Construction waste should be properly managed to prevent soil and water pollution. • Wildlife protection measures should be implemented, such as exclusion

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
potentially causing a significant change for wildlife. While the overall impact on fauna and flora is anticipated to be minimal and reversible in most areas, the specific location and scale of construction activities play a crucial role in determining the severity of the impact. For instance, noise from construction might temporarily disturb wildlife but is unlikely to cause lasting harm. However, the construction of dams and other structures could alter water flow patterns, affecting fish migration and potentially leading to population decline.				endangered and critically endangered species, including the Isok barb/Jullien's Golden Carp (Probarbus jullieni) and Leaping barb/Flying Minnow (Laubuka caeruleostigmata).		fencing and wildlife corridors. Additionally, construction activities should be avoided during sensitive periods for wildlife. • Environmental impacts should be regularly monitored, and the project must comply with environmental permits.
• **Destruction of farming ecosystem** - Heavy machinery and construction activities can compact the soil, reducing its porosity and ability to retain water and nutrients, ultimately leading to decreased land productivity. - Soil erosion from construction sites, exacerbated by the removal of vegetation and can transport sediments and pollutants into nearby water sources. - The risk of pollution from construction sites, specifically mentioning	• Construction activities • Alteration of water regimes due to irrigation infrastructure (dams, levees) • Pollution from agricultural runoff	• Activity 1.4.3 • Activity 2.1.2 • Activity 2.2.2	Aquatic and terrestrial species within and around farming areas **Moderate**	The project's construction of irrigation canals, flood control structures, and farm roads will involve large-scale earthworks, potentially leading to soil erosion and sedimentation, impacting water quality in rivers and canals crucial for irrigation. The removal of vegetation and ground disturbance during construction increases the risk of soil erosion and runoff, carrying sediment and pollutants into water sources used for irrigation and livestock. This pollution, coupled with the potential for increased use of agrochemicals due to enhanced irrigation	**Nature & Duration:** long term **Extent:** Indirect **Scale:** Local **Magnitude:** Moderate **Likelihood:** Possibly **Inherent Risk:** Moderate **Residual risk:** Minor	• Restrict the movement of heavy machinery to designated areas and use appropriate construction techniques to reduce soil compaction. • Implement erosion and sediment control measures such as silt fences, sedimentation basins, and hay bales to prevent soil loss and protect water quality. • Construction vehicles and machinery have to wash only in designated areas where runoff will not pollute natural surface water bodies. • Establish proper drainage systems to divert runoff from construction sites and prevent it from contaminating water sources used for irrigation and livestock. • Encourage the adoption of sustainable agricultural practices, such as reducing pesticide and fertilizer use, to

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
potential water contamination from sourcing aggregates and construction materials. - These pollutants, along with runoff from construction sites carrying sediment, oil, and chemicals, can directly harm crops, leading to reduced yields and potential health issues.				capacity, could negatively affect water quality, impacting the health of both crops and livestock.		minimize pollution from agricultural runoff. • Develop and implement a comprehensive water management plan that ensures the efficient use and allocation of water resources, minimizing the risk of over-extraction and downstream water scarcity.
GHG emission: The construction and operation of heavy machinery, such as excavators and bulldozers, during these projects release carbon dioxide (CO2) into the atmosphere, i.e. the energy requirements for construction works can result in increased carbon emissions Another source of GHG emission is waste burning from worker camp site. In addition, at the time of construction, there are possibility of smoke generated by burning of straw in the rice field.	Rehabilitation of irrigation canal and farm roads and burning of straw of farmers at the rice field	• Activity 1.4.3 • Activity 2.1.2 • Activity 2.2.2	Atmosphere **Minor**	The production and transportation of excavated soils and materials further add to greenhouse gas (GHG) emissions. However, due to the short duration of these construction activities, the overall increase in emissions is expected to be minimal and relatively small in scale.	**Nature & Duration:** Short and long term **Extent:** Direct, indirect, and cumulative **Scale:** Regional **Magnitude:** Moderate **Likelihood:** Likely **Inherent Risk:** Moderate **Residual risk:** Minor	• Use energy-efficient machinery and equipment during construction to reduce fuel consumption and emissions. • Optimize construction logistics to reduce the number of vehicle trips and machinery usage, minimizing fuel use and emissions. • Implement proper maintenance programs for equipment and vehicles to ensure they operate efficiently and with lower emissions. • Reduce deforestation and land-use changes that contribute to carbon emissions by preserving vegetation and replanting trees in affected areas. • Use low-carbon materials and construction techniques that reduce the embodied carbon in construction materials. • Offset unavoidable GHG emissions by investing in carbon offset projects, such as reforestation or renewable energy initiatives. • Engage with local communities and stakeholders to raise awareness of emission reduction practices and encourage their participation in sustainability efforts.
DURING OPERATION						

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
ENVIRONMENTAL POLLUTION		Comp 1,2				
• **Hydrology** - Increased irrigation demands could deplete water sources, if management is not properly conducted. - This may lead to poor management of environment flow for the water system	• Increased irrigation. • Poor water management practices • Climate change impacts (altered rainfall patterns)	• Output 1.1 • Output 1.2Output 2.3	Tonle Sap Lake. Upstream Watersheds Wetlands Aquatic Ecosystems Downstream Communities **Moderate**	Irrigation systems can have both positive and negative effects. Proper design and management are essential for reducing negative impacts on the natural hydrological cycle, especially the water availability.	**Nature & Duration:** Short and long term **Extent:** Direct & indirect **Scale:** local and regional **Magnitude:** Minor **Likelihood:** likely **Inherent Risk**: Moderate **Residual risk:** Minor	• Implement water-saving irrigation technologies like drip irrigation and sprinkler systems to reduce water consumption and minimize the strain on water resources. • Encourage the adoption of the AWD technique in rice cultivation to optimize water use and reduce water withdrawals for irrigation. • Establish detailed water management plans that ensure equitable water distribution and allocation, considering the needs of various users and the environmental flow requirements to maintain healthy aquatic ecosystems. • Design and construct robust irrigation infrastructure, including canals, ponds, and storage areas, capable of withstanding extreme weather events like floods and droughts. This investment should also include lining canals and refurbishing storage areas to reduce water losses and improve water storage capacity.
Water pollution: Increased use of chemical for intensified crop production may affect the overall water quality and affect people who rely on such water for domestic use. Impacts may include two levels: impact on surface water as immediate effect and underground water as long-term impact. **Soil pollution/ quality reduction:** Overuse of Agri-chemicals (e.g., chemical pesticides, fertilizers, etc.)	Intensification of agricultural production	• Output 1.1 • Output 1.2	Nearby residents Famers **Moderate**	When the irrigation become operationalize, the use of chemicals for farming activities can create potentially impact on soil and water quality, the extent of this impact is likely to be relatively moderate due to the intensification of agricultural production and changes in practices in the command areas as irrigation water become more available. The widespread use of chemical fertilizers and pesticides for rice	**Nature & Duration:** Short and long term **Extent:** Direct & indirect, cumulative **Scale:** local and regional **Magnitude:** Minor to Moderate **Likelihood:** Very likely **Inherent Risk**: Moderate **Residual risk:** Minor	• Implement Simplified Pesticide Management Plan • Conduct regular water and soil quality test to track the change in water quality due to pesticide application using oversea laboratory testing

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
				production, particularly when optimized for higher yields, is far significant contributor to soil and water quality degradation. These agricultural practices can lead to soil nutrient depletion, salinization, and pollution, ultimately compromising the long-term sustainability of agricultural production.		
BIODIVERSITY						
Habitat Loss and Fragmentation: • **Conversion of land:** Flooded forests and wetlands may be drained or filled to create more arable land for agriculture, leading to significant loss of habitat. • **Fragmentation:** Remaining natural habitats may become isolated patches, making it difficult for species to migrate, find mates, and maintain healthy populations.	Intensifying farming	• Output 1.1 • Output 1.2	Aquatic and terrestrial species **Minor**	At the micro, local, and regional levels, habitat loss is likely to occur due to land clearance during the construction phase. This loss is driven by farmers seeking to maximize profit from available land, and the scale of habitat conversion could extend beyond the local level, potentially impacting the region.	**Nature & Duration:** Short and long term **Extent:** Direct, indirect & cumulative **Scale:** local and regional **Magnitude:** Moderate **Likelihood:** Likely **Scale:** local and regional **Inherent Risk:** Minor **Residual risk:** Minor	• Implement Simplified Pesticide Management Plan
Hunting, trading, and consumption of animal from the wild: Even after the construction being completed, there may be the continuation of the hunting as market are available.	Intensifying farming and activities within the sub-scheme	• Output 1.1 • Output 1.2	Aquatic and terrestrial species **Minor**	Although the activities are likely to continue, it is not directly caused by the project activities, but it can expand further beyond the completion of the construction. The impact is minimal and considered to be regional, if trading continues to exist.	**Nature & Duration:** Long term **Extent:** Induced **Scale:** local and regional **Magnitude:** Moderate **Likelihood:** Likely **Inherent Risk:** Moderate **Residual risk:** Minor	• Implement Simplified Pesticide Management Plan
CLIMATE CHANGE						

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
GHG emission: The intensification of farming activities meaning that rice production will be increased into more times or more whereas the energy that are required for the production can be also increased. Smoke may be generated due to burning of straw in the rice field, particularly when water access for irrigation being increased. This will lead to the increase of volume of GHG emissions being emitted into the atmosphere.	Intensifying farming activities Increased used of energy for farming activities	• Output 1.1 • Output 1.2	Atmosphere **Minor**	Increased farming activities, driven by improved irrigation, can lead to higher GHG emissions due to factors such as fertilizer use, livestock production, and rice cultivation. Additionally, the energy requirements for operating pump stations, flood control systems, and other infrastructure elements can contribute to increased carbon emissions if not managed efficiently. These factors collectively highlight the potential for the project to have a significant impact on GHG emissions.	**Extent:** Direct & indirect Nature & **Duration:** Short and long term **Magnitude:** Minor **Likelihood:** Likely **Scale:** local and regional	• Encourage sustainable practices like crop rotation and agroforestry to reduce energy consumption and improve soil health. • Introduce renewable energy sources such as solar-powered irrigation to lower the carbon footprint of rice production. • Train farmers to use alternatives to straw burning, such as mulching or biomass energy generation, to reduce air pollution. • Utilize efficient irrigation methods like alternate wetting and drying (AWD) to conserve water and minimize methane emissions. • Advocate for policies that discourage straw burning and provide incentives for adopting sustainable agricultural practices.
ANNUAL CROP MANAGEMENT PLAN						
WATER						
Water resource efficiency: Over-extraction of water resources can lead to downstream water scarcity, altered hydrology, and damage to aquatic ecosystems.	Inefficient irrigation practices during operation	• Output 1.3 • Output 2.3	Downstream communities, aquatic ecosystems **Moderate**	Inadequate water management poses a significant risk to the long-term sustainability of water resources and dependent ecosystems and communities.	**Extent:** Direct & indirect Nature & **Duration:** long term **Magnitude:** Minor **Likelihood:** Likely **Scale:** local and regional	Project need to implement efficient water management practices to prevent over-extraction and ensure equitable water distribution. This can include: • water use monitoring system to track consumption and identify areas for improvement. • implementing appropriate irrigation scheduling based on crop water requirements and weather conditions. • Utilizing efficient irrigation systems, such as drip irrigation or sprinkler systems, to minimize water loss. • Exploring opportunities for water reuse, such as capturing and reusing runoff water.
SOIL AND SOIL MANAGEMENT						

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
Soil erosion and soil erosion risk: Soil erosion can lead to loss of topsoil, reduced soil fertility, and increased sedimentation in water bodies.	Land preparation activities such as tillage, site clearing, and the use of heavy machinery can increase the risk of soil erosion.	• Output 1.1	Soil health, water quality, and agricultural productivity. **High**	Unsuitable management techniques and land preparation activities can lead to the physical and chemical degradation of soils.	**Extent:** Potentially major Nature & **Duration:** Short and long term **Magnitude:** Minor **Likelihood:** Likely **Scale:** local	• Minimize soil compaction and disturbance by using appropriate machinery and timing land preparation activities. • Consider erosion management practices such as contour planting, terracing, and grass barriers. • Adopt reduced tillage or no-till farming practices to minimize soil disturbance. • Establish cover crops during fallow periods or in rotation with main crops to protect the soil from erosion. • Practice contour farming on sloping land to reduce runoff and erosion. • Construct terraces on steep slopes to prevent soil loss. • Establish windbreaks or shelterbelts to reduce wind erosion. • Install erosion control structures, such as grassed waterways or sediment basins, to manage runoff. • Apply mulch to the soil surface to protect it from rainfall impact and erosion.
Nutrient application and management: Excessive or improper nutrient application can lead to nutrient runoff and leaching, contaminating water resources and causing eutrophication.	Excessive or improper application of fertilizers can lead to nutrient runoff and leaching.	• Output 1.1	Water quality, aquatic ecosystems, and human health **High**	Over-fertilization and nutrient runoff can contaminate water resources, negatively impacting aquatic ecosystems and potentially leading to eutrophication.	**Extent:** Potentially major Nature & **Duration:** Short and long term **Magnitude:** Minor **Likelihood:** Likely **Scale:** local	• Conduct periodic soil analysis to determine nutrient needs and avoid over-fertilization. • Establish buffer zones near watercourses to filter nutrient runoff. • Consider using green manures and cover crops to replenish soil nutrients and reduce leaching.
PESTICIDE						
Use and effectiveness of pesticides: Pesticide use can have adverse effects on human health, non-target organisms, and the environment. Pesticide resistance can develop, requiring increased application rates.	Application of pesticides.	• Output 1.1	Human health (farmers and consumers), biodiversity, soil and water quality **High**	Pesticide use can have unintended consequences on human health, biodiversity, and environmental quality if not managed carefully.	**Extent:** Potentially major Nature & **Duration:** Short and long term **Magnitude:** Minor **Likelihood:** Likely **Scale:** local	• Promote Integrated Pest Management (IPM) strategies to minimize pesticide use. • Implement training programs for farmers on the safe handling and application of pesticides. • Ensure proper disposal of pesticide containers and leftover products.

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
Pesticide residues on site soil: Pesticide residues can accumulate in the soil, potentially contaminating groundwater and impacting soil organisms.	Repeated pesticide applications, use of persistent pesticides, and improper disposal of pesticide containers.	• Output 1.1	Soil health, biodiversity, water quality **High**	Pesticide residues can accumulate in the soil, potentially harming soil organisms and affecting water quality.	**Extent:** Potentially major Nature & **Duration:** Short and long term **Magnitude:** Minor to Moderate **Likelihood:** Unlikely **Scale:** Local and Regional	• Promote the use of pesticides with low persistence and mobility in the environment. • Implement a soil monitoring program to assess pesticide residue levels. • Consider crop rotation and the use of cover crops to help break down pesticide residues. • Minimize pesticide use by adopting IPM strategies. • Conduct soil testing to monitor pesticide residue levels. • Rotate crops to break pest cycles and reduce the need for repeated pesticide applications. • Utilize cover crops to improve soil health and enhance pesticide degradation. • Consider bioremediation techniques to remove pesticide residues from contaminated soil.
Pesticide residues on produce: Pesticide residues on produce can pose health risks to consumers.	Late pesticide applications close to harvest, improper pesticide application techniques, and inadequate pre-harvest intervals.	• Output 1.1	Consumers, human health.	Pesticide residues on produce can pose a risk to consumer health. **Moderate**	**Extent:** Potentially major Nature & **Duration:** Short and long term **Magnitude:** Minor to Moderate **Likelihood:** Likely **Scale:** Local and Regional	• Enforce pre-harvest intervals to allow for pesticide breakdown before harvest. • Promote the use of pesticides with low toxicity to humans. • Properly wash and handle produce to remove surface residues. • Implement a monitoring program to test produce for pesticide residues. • Ensure compliance with established MRLs for pesticide residues on produce.
AIR QUALITY, AIR EMISSIONS, AND ENERGY USE						
Energy use: Energy consumption contributes to greenhouse gas emissions and impacts operating costs.	Operation of machinery and equipment for various farming activities (tillage,	• Output 1.1	GHG emission, air quality, and operational costs	Increased energy use for farming activities, especially those powered by fossil fuels, can contribute to air pollution	**Extent:** Potentially significant Nature & **Duration:** long term **Magnitude:** Moderate **Likelihood:** Likely	The project needs to: • Promote the use of energy-efficient machinery and equipment. • Explore the use of renewable energy sources (solar, biofuels) for powering irrigation pumps and other farm operations.

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
	irrigation, harvesting, transportation) and the use of energy for processing and storage.			and greenhouse gas emissions. **Minor**	**Scale:** Local and Regional	• Encourage the adoption of sustainable practices that reduce energy needs, such as crop rotation, no-till farming, and optimized irrigation scheduling.

Table 19: Social Risks, Impacts, and proposed Mitigation Measures

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
BEFORE CONSTRUCTION						
Land acquisition and resettlement	Rehabilitation of irrigation canal and farm roads	• Activity 1.4.3 • Activity 2.1.1 • Activity 2.1.2 Activity 2.2.2	• Landowners • Informal land users, Informal resettles • Nearby construction site business owners/ **Moderate**	Based on the initial concept design, there is possibility regarding the acquisition of land for the construction.	Nature & Duration: Short and long term Extent: Direct and indirect Scale: local Likelihood: Likely Inherent Risk: Minor to Moderate	• The actual estimate of the land acquisition and land acquisition impacts has been on the process. The ESCIA team is working with the PMU, local authorities and communities to identify the scope of land acquisition and resettlement impacts of each sub-scheme. The information on the scope and cost estimate including the potentially affected households and persons, affected lands affected assets and affected income and livelihoods will be made available at the end of December 2024 as per the available information of the final concept design and decision making on the options of construction in each sub-scheme. However, the figure may be changed after the availability of the DED.
Economic displacement	Nearby residents	• Activity 1.4.3	• Landowners • Informal land users, Informal resettles	During the construction phase, the track-out of construction material transportation and the	Nature & Duration: Short and long term	• The actual estimate of the economic displacement has been on the process. The ESCIA team is working with the PMU, local

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
		• Activity 2.1.1 • Activity 2.1.2 Activity 2.2.2	Nearby construction site business owners **Moderate**	construction area will be affected directly on the economic activities of community people such as local businesses, transportation routes, rice production land, and daily movement within the command area. Diversion of water from the original channels can also cause the disruption of agricultural production, even crop failure. Once again, the estimated impact of economic displacement is still early to conclude.	Extent: Direct and indirect Scale: local Likelihood: Likely Inherent Risk: Minor to Moderate	authorities and communities to identify the scope of economic displacement of each sub-scheme. The information on the scope and cost estimate including the potentially affected households and persons, affected lands affected assets and affected income and livelihoods will be made available at the end of December 2024 as per the available information of the final concept design and decision making on the options of construction in each sub-scheme. However, the figure may be changed after the availability of the DED.
Facility Design	Detail Engineering Design	• Activity 1.4.3 Activity 2.1.1	• All **High**	CAISAR project aims to achieve the environmental-friendly, and climate resilience aspect. These aspects need to be carefully considered with all possible options to be included in the design. In this regard, it is expected to be fully considered and reduce the impacts at the minimum.	**Nature & Duration: Short and long term** **Extent:** Direct and indirect **Scale:** local **Likelihood:** Likely **Inherent Risk:** High	• Continuous consultation with relevant stakeholders to avoid disturbance to the environmental and social impacts of the project
DURING CONSTRUCTION						
Child Labor	Construction of the irrigation systems		Unskilled workers (mostly local people)	The risk of child involvement in project's labour force (e.g., contractors' labour) is foreseen because subproject activities will take place in rural areas where use of child labour is common. There is a possibility that local people under 18 years is engaged by construction contractors and subcontractors to perform unskilled works.	**Nature & Duration:** Temporary **Extent:** Direct **Scale:** local and regional **Likelihood:** Likely **Inherent Risk** Moderate **Residual risk:** Negligible	• Apply LMP for age check prior to engagement of labour

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
Forced Labor	Construction of the irrigation systems		Unskilled workers (mostly local people)	Risk of workers being forced to work (e.g. young people) to earn income for their family, and/or to pay debt. Forced labour could happen for both children under 18 and adults, particularly for households who are in high need to cash for specific family purpose.	**Nature & Duration:** Temporary **Extent:** Direct **Scale:** local and regional **Likelihood:** Likely **Inherent Risk** Moderate **Residual risk:** Negligible	• Strict Code of Conduct for workers with no tolerance for physical or verbal abuse of women or children • Provision of information to local communities about the contractor's policies and responsibilities, including the Contractor's Code of Conduct and minimum working age. • Provide counselling services for male and female workers, wives and other female partners of contractor's workers.
COMMUNITY HEALTH AND SAFETY						
Disease transmission	Construction or Rehabilitation of irrigation canal and farm roads	• Activity 1.4.3 • Activity 2.1.2 • Activity 2.2.2	Nearby residents Construction workers	• Spreading and contracting of communicable diseases of labour forces having direct and indirect contact among themselves. • Risk of contracting non–communicable diseases of workers due to working behaviours and pressures at the time of working away from home.	**Nature & Duration:** Temporary **Extent:** Direct & indirect **Scale:** local and regional **Likelihood:** Likely **Inherent Risk** Moderate **Residual risk:** Minor	• Conduct public awareness raising activities (IEC) to ensure local people and contractors know about the risks of contracting and spreading communicable diseases such as COVID-19, HIV/AIDS, and water-borne diseases (e.g., amoebiasis, giardiasis, and toxoplasmosis. etc. • In the event of a disease outbreak (e.g. COVID-19), provide immediate training/awareness raising to the risk groups. • Contractor's workers will be trained on communicable diseases prior to mobilization to construction sites. • For water-borne diseases that arise due to polluted or contaminated water, mitigations measures may include: • Ensure the water is visibly clean and free from sand and silt. Filter the water to get rid of visible dirt. • Drink only clean and safe water – either portable water or water filtered through water purifiers. • Get water purifying devices like filters, RO units, etc., regularly serviced and maintained. • Ensure stored water is germ-free.

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
						• Add antiseptic liquid, such as Dettol, in dubious-looking bathing water. • Hand hygiene – regularly wash hands with soap after returning home, after using the toilet, before and after preparing food, before eating or drinking anything. • Teach hand hygiene to children. Children should make it a habit to always wash their hands when returning home after playing games. • Ensure food is washed and thoroughly cooked. • Use disposable glass and plates whenever possible when eating outside food, particularly street food. • Avoid eating stale cooked food, unrefrigerated food kept exposed outside for long hours. • Take vaccinations for immunization against preventable diseases like Typhoid, Hepatitis A, Polio, etc.
Sexual Exploitation and Abuse, Sexual Harassment (due to labour influx)	Rehabilitation of irrigation canal and farm roads	• Activity 1.4.3 • Activity 2.1.2 • Activity 2.2.2	Project workers Local peoples, primarily vulnerable individuals (including female and children)	• The influx labour forces) but also people who are local and nonlocal that gravitate to construction sites temporarily to provide logistics services for contractor's workers during construction stage. This risk of Violence Against Children (VAC) is also anticipated due to increased level of SEA/SH and pre-existing risk of local domestic violence that might be present before the project.	**Nature & Duration:** Temporary **Extent:** Direct & indirect **Scale:** local and regional **Likelihood:** Likely **Inherent Risk** Moderate **Residual risk:** Minor	- Contractors need to explicitly state zero tolerance for sexual harassment, exploitation, and abuse within the workplace. - Require Code of Conduct (CoC) to be signed by all construction workers. - For victims coming forward: referral to qualified SEA/SH service provider. The GRM will include a confidential channel for reporting SEA/SH. - Strict Code of Conduct for workers with no tolerance for physical or verbal abuse of women or children

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
						- Training to workers on maintaining good community relations, with emphasis on proper conduct around women and children. - Training on SEA/SH and VAC for community members, in particular women and girls (may be done separately for men and women). - Ensuring workers' sites are situated (at least 500m) from schools and/or other areas where children congregate. - Children are prohibited from construction sites and worker's camp. - Ensure access to grievance redress mechanisms for all project-affected persons, including both stakeholders and workers, to address Sexual Exploitation and Abuse, and Sexual Harassment. Support (in the form of training, awareness raising, etc.) to local law enforcement to act on community complaints regarding SEA/SH and VAC. - Provision of information to local communities about the contractor's policies and responsibilities, including the Contractor's Code of Conduct and minimum working age. - Provide counselling services for male and female workers, wives and other female partners of contractors' workers. - Build partnerships with local

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
						health providers and SEA/SH service providers to conduct community awareness activities, and referrals. - Implement public awareness campaigns to address sexual harassment in transport services and hubs, and training of police on women's security needs when using transport. This is included on GRM: • Accessibility for Workers • Multiple Reporting Channels • Confidentiality and Support • Contractor Accountability
Security and Road and Traffic safety	Rehabilitation of irrigation canal and farm roads	• Activity 1.4.3 • Activity 2.1.2 • Activity 2.2.2	Project workers and local people traveling near construction sites and on transportation routes.	• Increased risk of road accidents, particularly for people living in the vicinity of the civil works and those traveling near the construction areas during construction phase, particularly when road condition is not good, and safety measures are not effectively carried out by contractors. Risk of road accident may be due to people' failure in attending their children which put children at risks of accidents.	**Nature & Duration:** Temporary **Extent:** Direct & indirect **Scale:** local and regional **Likelihood:** Likely **Inherent Risk** Moderate **Residual risk:** Minor	- Arrange security guard or engage local authority to guard the construction sites - Conduct public awareness raising activities (IEC) to ensure local people and road user are aware of road safety regulations and risks and act accordingly while using road. - Monitor and observe speed limit;
Community Health and diseases	• Rehabilitation of irrigation canals and farm roads. • Influx of construction workers into the project area.	• Activity 1.4.3 • Activity 2.1.2 • Activity 2.2.2	Nearby residents Construction workers	• Spreading and contracting of communicable diseases due influx of labour forces having direct and indirect contact with local people • Construction activities can disturb existing sediments and pollutants, temporarily	**Nature & Duration:** Temporary **Extent:** Direct & indirect **Scale:** local and regional **Likelihood:** Likely	• Ensure that safe drinking water and adequate sanitation facilities are available for both workers and the surrounding community to prevent waterborne diseases. • Organize health education campaigns for workers and community members, focusing on hygiene, safe water use, disease

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
	• Construction activities disturbing soil and water bodies.			increasing the risk of waterborne diseases	**Inherent Risk** Moderate **Residual risk:** Minor	prevention, and the proper use of sanitation facilities. • Implement vector control measures, including regular drainage of stagnant water, distribution of insecticide-treated bed nets, and community spraying programs. • Provide workers with appropriate personal protective equipment (PPE) such as masks, gloves, helmets, and other safety gear to protect against respiratory diseases, dust, and physical injuries. • Implement proper waste disposal systems for construction debris and hazardous materials, along with measures to prevent air, water, and soil contamination from the construction site. • Conduct regular health screenings for construction workers, especially for communicable diseases such as tuberculosis, and other infections. • Establish a grievance mechanism specifically for health-related issues, allowing community members to report any health concerns or complaints related to construction activities. • Monitor health trends in the project area, including disease outbreaks or unusual health issues, and report findings to local health authorities for coordinated action. • Implement dust suppression techniques, such as regular watering of roads, limiting construction activities during high winds, and using dust barriers where possible.
OCCUPATIONAL HEALTH AND SAFETY				•		•

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
Physical Hazards **Chemical hazards**	Construction or Rehabilitation of irrigation canal and farm roads	• Activity 1.4.3 • Activity 2.1.2 • Activity 2.2.2	Nearby residents Construction workers	• OHS risks identified under the project include physical hazards and chemical hazards. • Physical hazards represent potential for accident or injury or illness due to repetitive exposure to mechanical action or physical activities. • Chemical hazards represent potential for illnesses or injuries, both short and long term, and fatalities due to single acute exposure or chronic repetitive exposure to toxic, corrosive, sensitizing or oxidative substances.	**Nature & Duration:** Temporary **Extent:** Direct & indirect **Scale:** local and regional **Likelihood:** Likely **Inherent Risk** Moderate **Residual risk:** Minor	• Fence off all work sites adjacent to communities to avoid unauthorized access to the project sites and to prevent potential injuries. • Display warning signs including at unsafe locations. • If school children are in the vicinity, traffic safety personnel direct traffic during school hours. • Control driving speeds of project vehicles particularly when passing through communities or nearby schools, health centres or other sensitive areas. • Make sure the community is aware of the GRM and that they can access it. • Appoint an Environmental Health and Safety Officer (EHSO) who shall be responsible for training, monitoring and reporting on ESHS concerns and implementing health and safety related programs. • Conduct orientation for construction workers regarding emergency response procedures and equipment in case of accidents (i.e. head injury from falling, burns from hot bitumen, spills of hazardous substances, etc.), fire, etc.; health and safety measures, such as on the use of hot bitumen products for paving of project roads, etc.; prevention of HIV/AIDS, malaria, diarrhoea, and other related diseases, as well as Code of Conduct (including discussion of SEA/SH/VAC). • Regularly train/remind drivers of strictly observing speed limits and exercise good driving practices when driving construction supported vehicles through residential areas as well as other
Personal Protective Equipment						

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
						sensitive areas such as schools, pagodas, hospitals, markets, and other populated areas, including parking. • Educate drivers on safe driving practices to minimize accidents and to prevent spill of hazardous substances and other construction materials by providing covers over transporting dump trucks. • Barriers (i.e., temporary fence) shall be installed at construction areas to deter pedestrian access to these areas except at designated crossing points. • Sufficient lighting at night as well as warning signs should be provided in the periphery of the construction site. • The public/residents, and in particular children, shall not be allowed in high-risk areas, i.e., excavation sites and areas where heavy equipment is in operation. • Provide fencing on all areas of excavation greater than 2m deep. • Ensure reversing signals are installed on all construction vehicles. • Measures to prevent malaria if in areas where malaria is an issue, shall be implemented (i.e. provision of insecticide treated mosquito nets to workers, spraying of insecticides, installation of proper drainage to avoid formation of stagnant water, etc.). • Discharge of untreated sewage shall be prohibited. • Conduct road safety training for workers and roadside community. • Provide trainings on HIV/AIDS and STDs to workers and the community (separately)

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
						• Provide trainings on SEA/SH and VAC to workers and the community (separately) • Ensure particular attention is provided to the needs of women and other vulnerable persons. For instance, specific trainings for them should be facilitated by appropriate trainers (i.e. women-only training on HIV/AIDS and/or SEA/SH should be led by a female trainer). • Ensure access to grievance redress mechanism. • Ongoing consultations and awareness raising of local communities.
Underpaid pay and unequal treatment			Unskilled workers (possibly local people and construction workers)	Unskilled workers may be recruited and may be underpaid compared to the nature, scope, and quantity of work that they are expected to perform. They may also be asked to work under conditions that are hazardous to them, such as working without Personal Protective Equipment (as may be required for such work). Underpayment may also take place on the basis of gender, temporary work status – at the discretion of contractors.	**Nature & Duration:** Temporary **Extent:** Direct & indirect **Scale:** local and regional **Likelihood:** Likely **Inherent Risk** Moderate **Residual risk:** Minor	• Implement a grievance mechanism where workers can report issues related to underpayment or unequal treatment without fear of retaliation. • Advise companies to provide equal opportunities for employment and promotions to all workers, regardless of gender, ethnicity, or background, to avoid discrimination. • Regularly monitor and audit payroll and employment practices to ensure compliance with labour regulations and address any disparities. • Offer training and capacity-building programs for all workers to enhance their skills and qualify them for higher-paying roles. • Ensure that subcontractors and suppliers also adhere to fair wage and equal treatment policies. • Set up worker committees or unions to allow collective bargaining and ensure workers

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
						have a voice in addressing wage and treatment issues. • Provide accessible information to workers about their rights, entitlements, and the proper channels to address grievances. • Regularly engage with labour rights organizations or third-party auditors to evaluate labour conditions and make improvements where necessary.
CULTURAL HERITAGE	Rehabilitation of irrigation canal and farm roads	• Activity 1.4.3 • Activity 2.1.2 • Activity 2.2.2	Underground cultural sites/ **Minor**	Presence of cultural sites are reported. Although the construction occurs only at the existing canals and rivers, there is still possibility that these sites will be damaged by the construction's activities, especially the sacred site of local communities	**Nature & Duration:** Temporary **Extent:** Direct & indirect **Scale:** local **Magnitude:** Minor **Likelihood:** Likely **Inherent Risk** Minor **Residual risk:** Negligible	• Conduct archaeological surveys before construction in culturally sensitive areas. • Develop mitigation strategies to protect cultural heritage sites and involve local communities in preservation efforts. • Apply Chance Find Procedures.
Loss access to land and other assets:	• Temporary land acquisition for construction of: • New irrigation canals (tertiary and quaternary canals) • Roads (widening of existing roads) • Hydraulic structures (dams, reservoirs) Temporary restriction of irrigation access from existing reservoirs during construction	• Activity 1.4.3 • Activity 2.1.2 Activity 2.2.2	• Farmers • Fishers • Households along road sections • Vulnerable groups **Moderate**	The project's construction phase presents a significant risk of temporary or permanent loss of access to land and assets for local communities. Even in cases where physical resettlement is minimal, the acquisition of land, particularly along construction road, and main canals, can disrupt farming activities, restrict access to water resources, and business impacting the livelihoods of those affected. Temporary restriction of irrigation access during construction is anticipated, particularly from farming activities along the River,	**Nature & Duration:** Short term **Extent:** Direct **Scale:** local **Likelihood:** Likely **Inherent Risk:** Moderate **Residual risk:** Minor	• Once risks and impacts have been minimized or reduced, mitigate through compensation payment for affected assets and income generation activities. • Where land acquisition impacts remain, compensate people as per the project's LARPF. • Prioritize public land acquisition. If not feasible, acquire private agricultural land, which is anticipated to be small-scale at the household level due to linear land impact. • Avoid impact on land collectively owned by IP communities through alternative designs. • Conduct a thorough assessment of the project area's habitats to

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
				feeder canals, main canal existing reservoirs. This will affect income generation for farmers reliant on irrigation, and business along the canals.		identify potential impacts on local flora and fauna. • Establish construction exclusion zones around sensitive habitats to prevent disturbance. • Implement habitat restoration programs in areas where construction has occurred.
Loss access to natural resources	• Upgrading of existing reservoirs. • Construction of new dams. • Implementation of river training measures. • Temporary restriction of water access from existing reservoirs during construction.	• Activity 1.4.3 • Activity 2.1.2 • Activity 2.2.2	• Farmers • Fishers • Downstream communities **Moderate**	Farmers along main streams and feeder canals in the sub-scheme will face the issues. Additionally, the influx of construction workers and the establishment of temporary facilities like worker camps could put pressure on local resources, including water sources and forest products, potentially leading to exploitation and environmental degradation.	**Nature & Duration:** Short term **Extent:** Direct **Scale:** local **Likelihood:** Likely **Inherent Risk:** Moderate **Residual risk:** Minor	• Develop a water management plan: To minimize waterbody alteration during pre-construction activities and implement efficient water management practices to prevent over-extraction and ensure equitable water distribution during the operational phase of the project. • Engage with local communities and authorities: To understand and address concerns about potential impacts on natural resources, ensuring that project design and implementation minimizes disruption to existing livelihoods. This should also include awareness campaigns to inform workers about the importance of protecting natural resources and respecting local customs and traditions. • Develop and implement a plan to manage the influx of workers: This plan should include providing workers with information about local resources, rules, and regulations, monitoring worker activities to ensure compliance, and providing alternative options for water and other essential resources.
CROSS-CUTTING						

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
Social inequality	Engagement and consultations during system design and construction	• Activity 1.1.1 • Activity 1.4.1 • Activity 1.4.2 • Activity 1.4.3 • Activity 2.1.2 • Activity 2.2.2	Vulnerable groups	Risk of being unequally engaged and treated, during the design phase, construction and after completion of the system	**Nature & Duration:** Temporary **Extent:** Direct & indirect **Scale:** local **Magnitude:** Minor **Likelihood:** Likely **Inherent Risk** Moderate **Residual risk:** Minor	• Conduct participatory planning and regular consultations with local communities, particularly marginalized groups (e.g., women, smallholder farmers, indigenous communities). • Prioritize hiring local labour, with special provisions for disadvantaged groups (e.g., youth, women, minorities) in both skilled and unskilled positions. • Develop and enforce water allocation plans that ensure fair access to water resources for all users, including small-scale and subsistence farmers, during and after construction. • Implement fair and transparent compensation or resettlement plans for those displaced or affected by construction activities, especially vulnerable households. • Establish accessible and responsive grievance redress mechanisms, ensuring all community members can raise concerns or complaints during construction. • Conduct regular social impact assessments, with a focus on identifying inequality trends, and adjust project strategies to mitigate negative effects. • Provide support and training for affected communities to diversify their livelihoods, especially for those whose livelihoods may be disrupted by construction (e.g., farmers, traders). • Ensure transparency in the contracting process, including the selection of subcontractors and suppliers, with opportunities for local businesses, especially those run by marginalized groups.

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
Elite capture	Engagement and consultations during system design and construction	• Activity 1.1.1 • Activity 1.4.1 • Activity 1.4.2 • Activity 1.4.3 • Activity 2.1.2 • Activity 2.2.2	Vulnerable groups	The rich grabs both available land and water resources, creating greater social disparities	**Nature & Duration:** Temporary **Extent:** Direct & indirect **Scale:** local **Magnitude:** Minor **Likelihood:** Likely **Inherent Risk** Moderate **Residual risk:** Minor	• Consultation will be conducted farmers in potential command area, focusing on vulnerable/disadvantaged groups • Alternative livelihoods for vulnerable group are identified based on their needs vis-à-vis project's investment eligibility • Conduct consultation at community level (in the command area) to achieve a consensus on how water needs are balanced between different groups in one command area. • During subproject design, water availability, storage capacity, and water needs of upstream and downstream population are calculated to inform design, and water use coordination during project operation. • Water user groups should be established for upstream and downstream population and should be coordinated by a higher-level committee/group to negotiate and optimize water coordination • Guidelines/Manual should be developed to provide guideline for upstream and downstream communities at subprojects to meet, discuss, and achieve consensus on how water is distributed for equal use between upstream and downstream population
DURING OPERATION						
Community Health and safety	• Intensifying farming activities • Irrigation system operation	• Activity 1.4.3 • Activity 2.1.2 Activity 2.2.2	Laborers Community people	• Farmers and other labour directly involved in using chemicals inputs for crop production may be affected in terms of health (long-term) due to potential a) increased use	**Nature & Duration:** Temporary **Extent:** Direct & indirect **Scale:** local	• Promote sustainable agriculture practices • Implement Simplified IPM Plan

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
				of chemical inputs (e.g. pesticide) • Overuse of pesticide causing harmful residue within agricultural produce which affect consumers' health in the long run.	**Likelihood:** Likely **Inherent Risk:** Moderate **Residual risk:** Minor	
CROSS-CUTTING						
Gender inequality	Limited access for women to training, resources, and decision-making processes related to irrigation and agriculture.	• Activity 1.1.4 • Activity 1.1.3 • Activity 1.1.4	Women farmers and laborers	The risk is rooted in pre-existing gender inequalities in Cambodia, where women have less access to resources, technology, and decision-making power. The assessment has shown that women are less resilient to climate change than men, and they face specific vulnerabilities in terms of income, housing, and access to information and support systems. Socially determined gender roles can also impact the adoption of climate-smart technologies. Consequently, these factors could lead to unequal access to water resources, limited participation in FWUCs, and a disproportionate burden of negative impacts on women's livelihoods.	**Nature & Duration:** Short term and long term **Extent:** Direct, indirect, cumulative **Scale:** local **Likelihood:** Likely **Inherent Risk:** Moderate	• The project should actively encourage women's participation in the formation of FWUCs, empowering them through critical decision-making roles and equipping them with the necessary skills and resources to amplify their voices. • The project should ensure that women have equal access to training programs and resources, such as land, credit, and technology. • The project should monitor gender equality indicators and should make adjustments as needed to ensure that women are benefiting from the project.
Social inequality	• Competition for water resources among different user groups (farmers, communities, industries). • Potential displacement or restricted access to land due to irrigation	• Activity 1.1.1 • Activity 2.3.1 • Activity 2.3.2	• Farming communities • Indigenous populations (if present). • Landless or land-poor households. • Vulnerable groups/ . **Minor**	The focus group discussions confirmed that the landowners of project areas in all command areas are mainly local communities, giving similar access capacity to the consultation process. However, the field survey reported that the vulnerable are generally those who have no	**Nature & Duration:** Short term and long term **Extent:** Direct, indirect **Scale:** local and regional **Likelihood:** Likely	• Ensure Equitable Water Access: Mechanisms should be in place to support vulnerable and marginalized communities in accessing water resources. • FWUCs will manage the irrigation systems and ensure sustainability through fee collection. The project will invest in establishing and training FWUCs, emphasizing

Risks and Impacts	Key activities that cause risks and impacts	Project component	Receptors/ Sensitivity	Assessment of Risks and Impacts	Extent	Proposed Mitigation Measures
	infrastructure expansion. Engagement and consultations during system design and construction			farmland, giving them limited access to benefit from the rehabilitated system. There are arguments at provincial and district level regarding the effort given to the poor which may end up limited efficiency and effectiveness due to lack of various resources and capacity in making the support reach its full potential. The scale of the impact is minimal due to the proportion of the poor is quite small at the command area. However, the poor may benefit from the system as some of them own a small piece of land at home for gardening.	**Inherent Risk:** Minor	inclusivity and capacity building for vulnerable groups. • Implement a Simplified Integrated Pest Management (IPM) Plan.
Elite capture	• Unequal distribution of project benefits, favoring powerful individuals or groups at the expense of the intended beneficiaries. • Engagement and consultations during system design and construction	• Activity 1.1.1 • Activity 2.3.1 • Activity 2.3.2	• Smallholder farmers • Marginalized communities • Vulnerable groups/ **Minor**	Since the landowners within the command areas are primarily from the local community, it is unlikely that elite land capture will occur. Additionally, the current high land prices make it unaffordable compared to the investment cost, reducing the incentive for such practices. However, there is a possibility that the wealthy may attempt to encroach upon protected areas, using their power, networks, or resources to seize land. While this is unlikely given the government's current commitment in its new mandate, if it does happen, the impact could extend to the regional level.	**Nature & Duration:** Short term and long term **Extent:** Direct, indirect **Scale:** local and regional **Likelihood:** Likely **Inherent Risk:** Minor	• Transparent and accountable FWUC management: Clear guidelines, diverse representation, and grievance redress mechanisms are essential to prevent manipulation and ensure equitable water distribution. • Regular monitoring and evaluation: Continuous monitoring of project impact, especially on vulnerable groups, can identify and address elite capture. • Strengthened land tenure security: Clarifying land rights can protect smallholder farmers and marginalized communities from land grabbing. • Community engagement: Active community participation, especially from vulnerable groups, empowers them and ensures their needs are met.

6. STAKEHOLDER ENGAGEMENT AND INFORMATION DISCLOSURE

6.1 Purpose and Process of Stakeholder Engagement

Public consultation is a key component of CAISAR, and it was pivotal in preparation of the Environmental, Social, Climate Impact Assessment report (ESCA) Report and the Environmental, Social, Climate Management (ESCM) Plan. The consultations were conducted with relevant institutions, non-governmental organizations, local authorities, and local people during the preparation of ESCIA and ESCMP for CAISAR project. The data collection and consultations were conducted in four periods:

- The first consultation was conducted between 26 and 28 July 2024 to capture information regarding biodiversity and environmental condition in the project area.
- The second consultation was conducted to consult with forestry and fishery communities, local authorities and key informants to understand the situation and concerns related to the presence of the project. The consultation was conducted between 03 and 09 August 2024.
- The third consultation was conducted at household, village, and commune level stakeholders focusing on status, concerns and feedback regarding the project implementation. This consultation was conducted between 10 and 18 August 2024.
- The last consultation was conducted between 21 and 23 August 2024 with the district and provincial stakeholders, mainly focusing on the opinion, and feedback regarding the implementation of the project.

In addition to the stated consultations, there are also continuous consultations being conducted with AIIB, IFAD, and CAISAR PMU including the PMU management, SECAP team, and engineering team to ensure that the disclosed information being aligned with the most updated information of the project.

During project preparation, various stakeholders have been consulted in July and August 2024. Table below summarizes the number of people consulted by consultation techniques:

Levels	Household survey (Beneficiaries and Potentially Affected)	Focus Group Discussions	Key Informant Interviews	**Total**
Village level	65	59	4	128
Commune level			3	3
District level			2	2
Provincial level			2	2
			Total	135

6.2 Consultation Process

The purposes of the consultation were to:

- Inform local people and interested stakeholders of the purpose of the rehabilitation and construction of the irrigation system,
- Share the project information and the design options from the draft engineering design,
- Highlight subproject's key activities that are potentially associated with them, and

- Collect their opinion, concern and feedback on the project focusing on background information, project potential impacts (positive and negative), suggestions for impact mitigations, and consultation mechanism.

The consultation agenda with stakeholders included (i) the introduction of the study team, (ii) sharing project information using illustration materials, (iii) discussion and consultation on potential benefits and impacts of the project, (iv) suggestions on the mitigation measures, (v) grievance process and concerns, and (vi) final wrap up for the consultation. The study team were trained to introduce themselves to the purpose of the consultation, followed by the introduction about the project's component and activities expected to be implemented within the area. Materials including leaflet on project information and map of the command area were shared and explained to stakeholders prior to the consultation. Lastly, the consultation began with an overall discussion and specific questions as per the relevant aspect to the stakeholder. Opinions, concerns and suggestions were gathered and confirmed prior to the end of the consultation.

6.3 Results of Consultation

6.3.1 Environment and Biodiversity Component

6.3.1.1 Pollution prevention and resource efficiency

Concerns

- The construction process can release dust, which will disturb the local community and surface water quality.
- The disposal of solid, liquid, and domestic waste from the workers at the irrigation construction site will negatively impact local air quality and surface water.

Feedback and Suggestions

- Regularly watering on the road transports construction materials and soil to reduce dust that may disturb nearby residents.
- Install garbage bins and waste storage areas in the construction sites and conduct orientation workers to put the waste in the garbage bins.

6.3.1.2 Biodiversity

Concerns

- The fish populations in command areas may decrease due to disrupting the natural flow of water and the impact on their habitats from the implementation of the reirrigation infrastructure and canal upgrading.

Suggestions from the consulted people

- The project should avoid construction activities and improve irrigation on fish and aquatic habitats.
- Prevent damage from the construction activities to biodiversity, habitats, and other environmental components.
- Maintain existing large trees along the dam and canal within the sub-schemes during the reirrigation and upgrading process.

6.3.1.3 GHG emission

Concerns

- Climate change is negatively impacting rice production, causing problems such as increased disease, insect infestations, and extended dry seasons,

Suggestions from the consulted people

- Installing solar water pumps in agriculture processing facilities can reduce fuel consumption, which causes greenhouse gas emissions.

6.3.2 Social Component

6.3.2.1 Labor and Working Conditions

Concerns

- The presence of construction staff and workers could lead to gender-based violence affecting women workers, women and children in the community.

Suggestions

- Should offer training to their staff and workers on gender issues, violence, and legal protections.
- Preventive support measures should also be put in place to stop abuse, and any incidents must be swiftly handled to avoid repetition. The training should be conducted by technical officers.

6.3.2.2 Community Health and Safety

Concerns

- Concerns about the presence of workers could cause sexual abuse of women and children living near the project site.

Suggestions from the consulted people

- To prevent incidents, construction staff should regularly place warning signs and water the roads, as well as schedule construction times to minimize noise pollution that could disrupt the community and notify authorities upon project completion to avoid quiet handovers.

6.3.2.3 Land acquisition, economic and physical displacement

Concerns

- Landowners along the irrigation system without land registration are concerned they may not receive compensation due to the lack of title deeds.
- Conflicts between the project and affected families could emerge, often fuelled by external instigators rather than the families themselves.

Suggestions from the consulted people

- A preliminary study on land issues before construction is recommended, with each sector addressing specific aspects of land impact and conducting evaluations for each affected property.
- The project/construction company must collaborate with local authorities to resolve land-related issues, and compensation should be provided to landowners affected by the project.

- The construction company should submit quarterly monitoring reports on implementation activities to the provincial department to identify and quickly resolve any issues.
- The government is requested to assist in issuing land titles to farmers with land adjacent to streams and canals.

6.3.2.4 Cross–cutting risks and impacts

Concerns

- Provincial department facing of limited budget to develop and rehabilitate the existing irrigation system

Suggestions from the consulted people

- The project should thoroughly examine the technical and situational aspects of the sub-scheme before construction to prevent water shortages or flooding post-construction, and it should be implemented promptly.
- Establish a Farmer Water User Group (FWUG) to oversee water use and maintenance by providing technical and management training, materials supported to effectively control and manage water distribution.
- The water consumption fee should be gathered from farmer which could be used later to support caretaker and maintenance the irrigation system.

6.3.2.5 Agricultural Production

Concerns

- The high cost of agricultural inputs continues to reduce farmers' profits.
- Climate change is negatively impacting rice production, causing problems such as increased disease, insect infestations, and extended dry seasons.
- Manure for fertilizer is declining due to reduced animal raising and lower cattle prices are prompting farmers to reduce livestock raising.

Suggestions from the consulted people

- Build more water storage and reservoir which able to store more water
- The irrigation should be constructed based on technical and water conditions in the area.
- Utilizing durable concrete for the canal system can improve the efficiency and longevity of the irrigation infrastructure.
- Installing and upgrading damaged sluice gates in both main and secondary canals can improve water distribution efficiency and prevent water loss in agricultural production and reirrigation systems.
- Construct both side roads along the canal to enhance transportation for farmers and traders.

6.4 Stakeholder Engagement during Sub–Scheme Implementation

During the implementation of the sub–scheme, particularly prior to construction, when locations of contractor’s office, workers’ camp, disposal sites for construction debris and construction waste, and labor management plan, etc. are identified – based on Contractor’s ESMP, environmental and social risks and impacts associated with Contractor’s specific construction

methods and measures will be updated in C-ESMP and disclosed for continued consultation with local people and local authorities to avoid/minimize E&S risks and impacts.

6.5 Information disclosure

This ESCMP will be disclosed to the public in both English and Khmer language. The English version will be disclosed in full version whereas the Khmer version will be disclosed as Executive Summary. The documents will be disclosed on the website of MOWRAM (as Project Implementation Unit), and on the website of AIIB, IFAD and GCF before project appraisal and project approval – as per disclosure guidelines required by each donor.

7. GRIEVANCE REDRESS PROCEDURES

7.1 Objectives of the Project GRMs

The objective of the GRM is to provide affected people with redress procedures that can be conveniently used to raise a project related concern or grievance. The GRM guides how a complaint can be lodged, including forms and channels through which a complaint can be submitted. To facilitate the grievance resolution process, grievances received will be acknowledged in writing and solved within a specified timeframe. During the resolution process, where necessary, dialogue will be held with aggrieved people for mutual understanding and effective resolution. Once a complaint is resolved, the aggrieved person will be notified of the resolution results.

The GRM has sequential steps that aggrieved person can use. If the aggrieved person is not satisfactory with the grievance resolution result, or if their complaint is not resolved within the timeframe specified for a particular step, aggrieved person can move on to the next step which is higher in resolution hierarchy. The project has an appeal process where complainants can resort if they are not satisfied with a resolution decision at a particular step, or their complaints are not resolved within a specified timeframe.

7.2 Summary of National Legislation Related to Grievance and Complaint

The RGC has various laws and sub-decrees that have been in place to guide the implementation of the complaint resolution process. These documents specify the right of the complainants as well as the responsibilities of concerned governmental agencies as to complaint resolution. Relevant legal documents include:

- Law on Expropriation (dated 26 February 2010)
- Labor Law (dated 13 March 1997, amended on 20 July 2007 and 26 June 2018)
- Law on Prevention of Domestic Violence and Protection of Victims (dated 24 October 2005)

- Sub-decree No. 22 ANK/BK (2018) on Standard Operating Procedures for Land Acquisition and Involuntary Resettlement for Externally Financed Projects in Cambodia. Guidelines for Grievance Redress Mechanism (Appendix 8)
- Law on Administrative Management of Capital, Provinces, Municipalities, Districts and Khans (dated 22 May 2008) – Section 6 on Solution of Local Conflicts
- Sub-decree No. 22 (25 March 2002) on Decentralization of Roles, Functions, and Power to Commune Councils (Article 61: duty to promote the role of conciliating disputes between citizens)
- Sub decree No 47 ANK.BK (31 May 2002) on Organization and Functioning of the Cadastral Commission (Chapter 4 – District/Khan Level Conciliation).

7.3 Principles of the Project GRMs

Under CAISAR, the following principles will be applied:

- Channels. Different channels are established to enable affected person to submit their grievances, including submission to village committee, as well as district and provincial levels.
- Forms. Grievances can be submitted in writing and verbally, and either directly by the affected households, or by a person delegated by the complainant.
- Complainant can delegate a representative who acts on their behalf. A person lodging a grievance can ask assistance from their family or from individual to act as their representative.
- Disclosure. GRM procedures are disclosed in public domain (e.g., websites of PMU, public notice board at village hall, and in front of substation).
- Documentation. A grievance logbook will be maintained at substation (subproject level) and at PMU level (through PMU GRM focal point).
- Transparency. Grievance procedures include steps, time frame for grievance resolution for each step, notification to affected person, how decision is made.
- Acknowledgement. The unit in charge of complaint resolution will notify complainant upon complaint receipt and will initiate the complaint resolution process.
- Appeal. If the agency in charge does not resolve a grievance in a manner that is satisfactory to the affected person, a multistakeholder committee will be established (ad-hoc) to resolve the dismissed grievance – as an alternative for affected person going to court.
- Monitoring. All grievances received are recorded by PMU and relevant substations, and are processed/resolved in a given timeframe, and are monitored by PMU GRM focal point.
- Time-limit. Time-limit is specified for each step in the grievance resolution process.

- Complainants bear no costs. Complaint resolution is free of charge to aggrieved person. However, if the complaints bring their case to court, they will bear the costs associated with their lawsuit.

- Any grievance concerning urgent health and safety issues shall be resolved immediately.

7.4 Project's Redress Procedures

The project has in place complaint handling procedures for three types of potential grievances, including grievances related to 1) land acquisition, 2) labour and working conditions, and 3) sexual exploitation and abuse and sexual harassment (SEA/SH/GBV/GBV), and 3) general complaints. These procedures are established based on the above GRM principles and are in accordance with pertinent national legislation. The GRM for complaints related to land acquisition is provided in the project's Resettlement and Policy Framework (RPF) and that for IPs is provided in the project's IPPF. Summary for the above four procedures is provided below:

7.4.1 Redress Procedure for Complaints related to Land Acquisition

Under this project, to facilitate the grievance redress, the informal and formal steps are combined for convenient use of affected people, as follows:

- Step 1 − Commune/Sangkat level. APs will seek assistance from commune/Sangkat chief or community elderlies who will discuss with the leader of the PRSC-WG to find a solution. Verbal grievance can be provided to the commune/Sangkat chief or community elderlies. So, no written complaint is required. It is noted that even if the complaint is made verbally, the complaint will be registered in project's logbook, including resolution process and result for such verbal grievance for monitoring purpose. Upon receipt of the verbal complaint, the PRSC-WG will consult with the IRC-WG to ensure the complaint is addressed timely. If the grievance is not resolved to the satisfaction of the AP, or if the AP prefers, s/he may lodge their complaint through the formal route which includes the steps below.

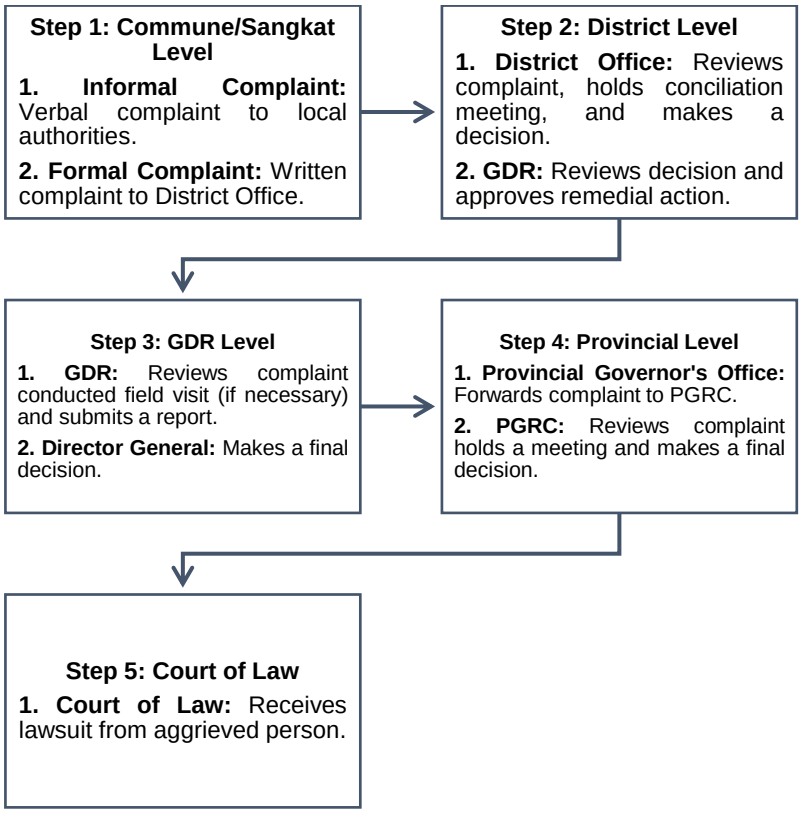
- Step 2 − District level. AH can lodge a written complaint to the Head of the District Office (where the subproject is located). The AH can bring a community elderly or their representative to discuss their grievance at the District Office. A conciliation meeting shall be held, and a decision be made within 15 working days from the date of complaint is received by the District Office. If the complaint is resolved to the satisfaction of the AH, the IRC-WG will inform GDR's Department of Internal Monitoring and Data Management (DIMDM) who will review and seek the approval of the Director General of GDR for appropriate remedial action. GDR will inform the AF of the decision/ remedial action within 15 working days from the receipt of the grievance by the District Office. If the complaint is rejected at this step, District Office will inform the AH of the rejection in writing. If the complainant is not satisfied with the decision/resolution result, s/he can proceed to step 3 (below).
- Step 3 − GDR level. The complainant who is not satisfied with proposed resolution from Step 2 shall lodge a written complaint to the GDR for resolution. The GDR, through its DIMDM, will carry out a holistic review of the complaint and submit a report on its findings with the relevant recommendations, if any, to the Director General of GDR for review and decision. GDR may conduct a field visit to meet the complaint and the IRC-WG to gather relevant information. The final report must be completed within 30 working days from the

date of receipt of the complaint by GDR for submission to the Director General of GDR who will make a final decision within 5 working days of receipt of the final report. In the event that the subject matter requires a policy level intervention, it will be referred to the IRC for a decision which may require that an additional 10 working days be extended from the original deadline for final decision.

- Step 4 − Provincial level. AH will submit a written complaint to the PGRC through the Provincial Governor's Office. The complainant or a representative will be given an opportunity to present its case during a meeting and the PGRC may consider any compelling and special circumstances of the AH to inform their decision. The GDR will send a representative, as a non-voting member, to provide an explanation to the rejection of the complaint at Step 3 with the GDR. The decision of the PGRC must be made on a consensus basis and will be final and binding except when the matter relates to government's policy. Decisions related to government's policy matters on land acquisition and resettlement are decided by the IRC. The PGRC will have 40 working days from the date of receipt of the complaint to reach a final decision. The decision of the PGRC will be sent to the IRC (through the GDR) for endorsement before any remedial action is taken. There are no fees or charges levied on the AH for their lodgment of complaint and for complaint resolution for the above 4 steps.

- Step 5 − Court of Law. If the aggrieved person prefers filing a lawsuit at the Provincial/Municipal Courts, as applicable, to seek a resolution, AP can do so but will bear cost related to the lawsuit as per the Expropriation Law. When the case is brought to a Court of Law, there is no involvement of the GDR, PRSC or IRC-WG unless there is a judicial order from the competent courts.

Figure 1. Redress Procedure for Complaints related to Land Acquisition



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7.4.2 Redress Procedure for Complaints Related to Labor and Working Conditions

Project workers can lodge their grievance/complaint as follows:

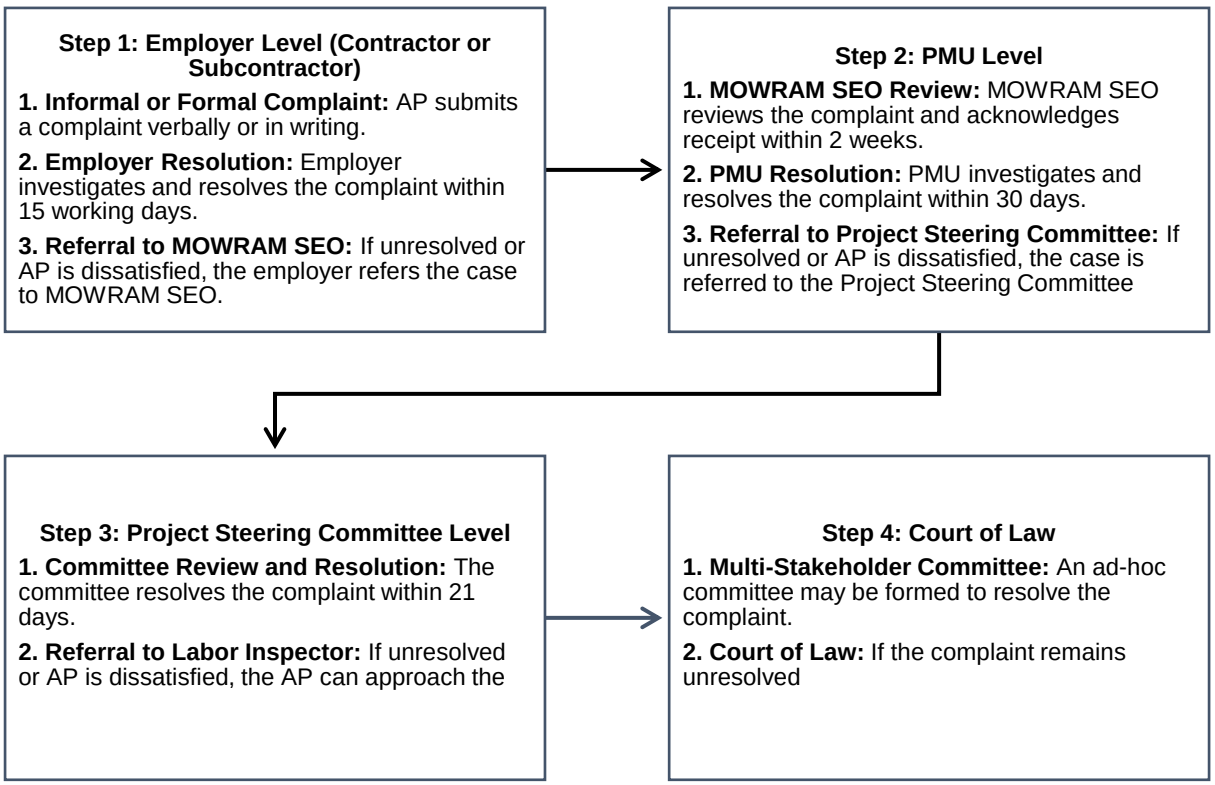
- Step 1 – Employer Level (Contractor and Subcontractor). Aggrieved person (AP) can submit their grievance to their Employer who serves as the first focal point for receiving and resolving grievance. Grievance can be lodged verbally or in writing, in person or by phone, text message, mail or email (anonymous complaint is accepted). The Employer involved will resolve the case no later than 15 working days. Once resolved and the AP is satisfactory, the Employer will report the case, including resolution process and results, to the SEO of the MOWRAM for information and record. If the AP is not satisfied with the resolution of their Employer, the Employer will refer the AP to the SEO of MOWRAM, if needed and inform the AP of this referral. It is noted that if a complaint concerns the safety and health of one or several individuals, such complaint shall be resolved as soon as possible – depending on the nature and urgency of the grievance.

- Step 2 – PMU level. MOWRAM SEO will resolve the complaint referred to by the Employer (Step 1) and acknowledge receipt of the AP's complaints within two weeks from the date of complaint receipt. If the SEO of MOWRAM cannot resolve the complaint, the SEO Team will consult with the Project Manager/Director for resolution. The SEO of the MOWRAM will inform the AP (in writing) of the PMU's resolution result within 30 days from the date of complaint receipt. If the AP is not satisfied with the resolution result proposed by PMU, PMU will refer the case to the Project Steering Committee of the project and shall inform the AP (in writing) of this referral.

- Step 3 – Project Steering Committee level. At this level, the case will be resolved no later than 21 days. The AP will be informed of the resolution decision in writing. In case the grievance has not been solved within the specified timeframe, or the AP does not agree with the proposed resolution, the AP can approach the Labor Inspector of his/her province or municipality.

- Step 4 – Court of Law. If the AP is not satisfied with the resolution proposed above, a multistakeholder committee will be established (ad-hoc) to resolve the dismissed grievance – as an alternative for affected person going to court. If the grievance could not be resolved satisfactorily by the multistakeholder committee, the affected person may resort to the court of law. The cost associated with the lawsuit shall be borne by the AP. The decision of the Court will be final.

Figure 2. Redress Procedure for Complaints Related to Labor and Working Conditions



7.4.3 Redress Procedure for Complaints Related to SEA/SH/GBV

Under the project, the GRM for SEA/SH/GBV mainly serves to: (i) refer complainants to a local GBV service provider; and (ii) record resolution of the complaint. In line with the above, the following principles apply so as to recognize SEA/SH/GBV victim as principal decision makers in their own care, and treat them with agency, dignity and respect for their needs and wishes: § Multiple channels are in place for easy access and lodge complaints.

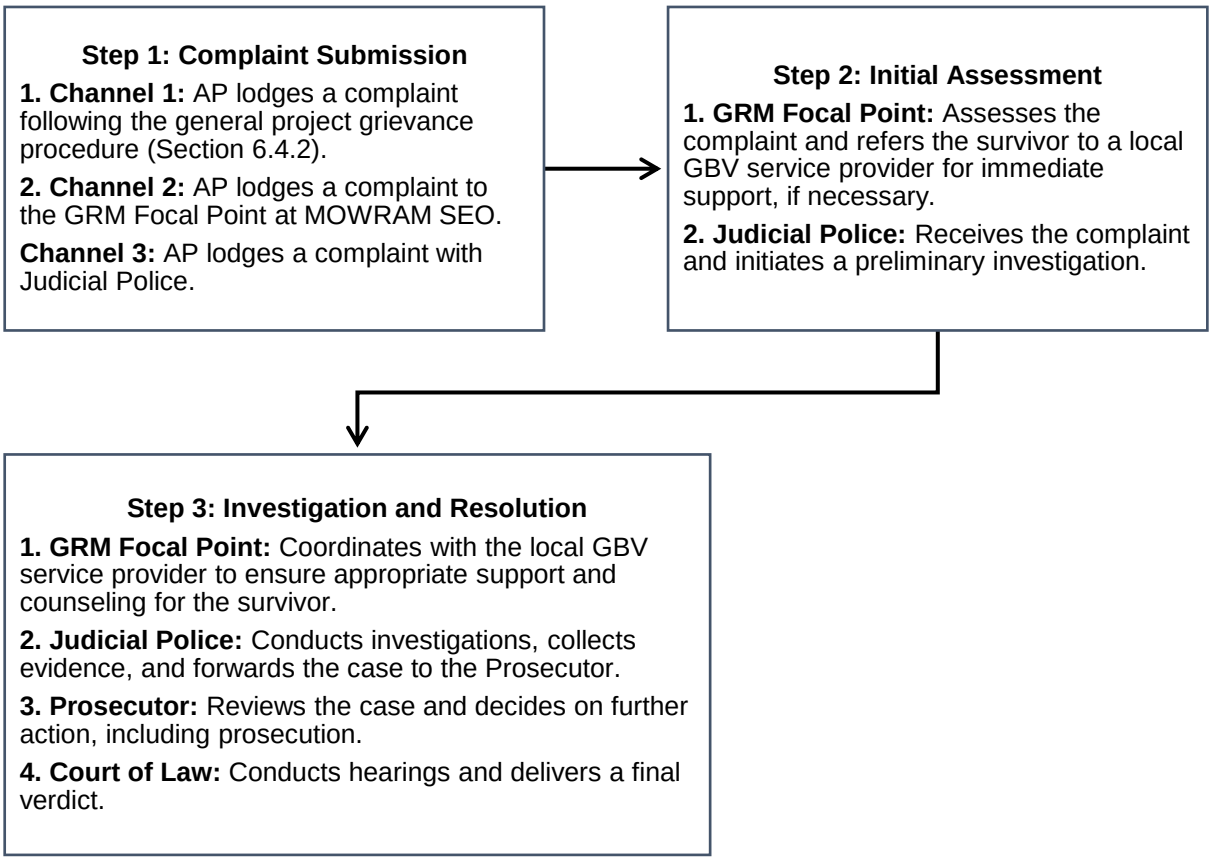
- SEA/SH/GBV survivors will be referred to a local GBV service provider for immediate support if they make a complaint directly to PMU.
- Confidentiality of survivors is protected. GM operator (at PMU and local GBV service providers) will keep confidential for SEA/SH/GBV allegation report.
- No identifiable information on the survivor shall be collected and stored in Project Grievance Logbook.
- Costs of operating the SEA/SH/GBV GRM will be covered by the project.

It is noted that under this project, GBV service provider will be engaged for subprojects that are rated “High” or “Substantial” for SEA/SH/GBV risks − as part of site-specific ESMP. based on SEA/SH/GBV risk assessment The following channels can be used to submit a grievance related to SEA/SH/GBV:

- Channel 1 – AP who believe the SEA/SH/GBV incidence is related to project workers can follow steps outlined in Section 6.4.2 (above) to lodge a SEA/SH/GBV complaint.
- Channel 2 – Alternatively, AP can lodge their complaint, verbally or in writing, to the GRM’s Focal Point within the SEO of MOWRAM for advice and resolution (contact of GRM Focal Point is provided in Section 5.1 (Resources).

- Channel 3 – If AP wants to bring the case to the Court of Law, AP can follow steps below for prosecution. Prosecution related to SEA/SH/GBV is administered under the Criminal Code and the Code of Criminal Procedure and is as follows:

    - Figure 3. Redress Procedure for Complaints Related to SEA/SH/GBV



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- Step 1 – Judicial Police. SEA/SH/GBV victim or a representative can submit their grievance to a local Judicial Police (JP) Officer. JPs include a) Commune/ Sangkat Chief, b) Commune/ Sangkat/ District/ Provincial/ National Police, and c) District/ Provincial/ National Military Police. The JP is responsible for receiving, recording complaints, and may conduct preliminary investigations to identify and arrest the perpetrator. The JP will also collect evidence to support the prosecutors. If the SEA/SH/GBV happens at home and/or falls under the domain of domestic violence (as per Law on the Prevention of Domestic Violence and Protection of Victims), the SEA/SH/GBV survivor may seek support from a local qualified Judiciary Police Officer (appointed by the Ministry of Women's Affairs) who can act as a complaining party on behalf of the SEA/SH/GBV survivor15.
- Step 2 – Prosecutor. Upon receiving the completed written record from the JP, the prosecutor can decide on if the prosecutor will hold a file without processing it further or conduct proceedings against the perpetrator. The prosecutor may bring the case to the Court of Law and present the evidence in Court hearings.
- Step 3 – Investigation by Judge. During this step, the investigating Judge will conduct interrogation of the charged person and perform other required investigation procedure.

- Step 4 – Hearing. After issuing an order of indictment, the investigating Judge will submit the case to the trial court president who shall arrange a date for the trial. The decision of the Court on SEA/SH/GBV resolution is final.

7.4.4 Redress Procedure for General Complaints

In case individuals, households, or communities are affected by any other aspects, for instance, environmental impacts such as increased dust, noise, or lack of safety measures that increase risks of traffic accident to road users or to local EM, various channels will be established for convenient use by affected parties, including IPs. These include:

- PMU GRM focal point's telephone (See Section 5.1 – Resources). o Local EM leaders (in case affected individual/households are EM)
- Contractor's hotline: to report cases that they think contractors can solve timely (contact detail of Contractors will be posted at construction sites, and distributed to IPs (through Subproject Information Booklet) during consultation, and post at public billboard of Commune/Sangkat offices, pagodas, etc.
- Commune/Sangkat offices

7.5 Registration of Project Grievance

The SEO, Project 6. Managers within MOWRAM is responsible to establishing and maintaining the project grievance logbook (PGL). The PGL will be established by the SEO to record all concerns/ grievance that are submitted by project stakeholders during project implementation. In case there is serious complaint, the World Bank should be notified of these complaints within 24 hours of complaint receipt (See Annex 3 for Guidance for establishing and maintaining Project Grievance Logbook).

The GRM is an integral project management element that intends to seek feedback from beneficiaries and resolve of complaints on project activities and performance. The GRMs for the project are based on IAAB, IFAD, UN, and GCF requirements and, most importantly, national requirements for solving potential problems between project owners and residents/persons affected by the subproject(s).

8. IMPLEMENTATION ARRANGEMENTS

8.1 Environmental and Social Duties of the PMU/Detail Design Consultants

8.1.1 MOWRAM'S PMU

The MOWRAM's PMU will work closely with PDWRAM in planning and implementing subprojects located within their province. The PDWRAMs will also supervise project officers at the district-level Department of Water Resource and Meteorology, and are responsible for:

- Coordinating effectively with all project stakeholders, including MOWRAM's SEO, consultants, contractors, local authorities, provincial departments, and project communities.

- Supporting provincial and district-level project officers in monitoring and evaluating progress and performance of consultants and contractors.
- Supporting MOWRAM'S SEO to conduct training on labor, gender, SEA, SH, VAC, and HIV/AIDS.
- Supporting MOWRAM'S SEO to disseminate project information and conduct consultation activities, as well as ensuring effective grievance redress resolution within their province.
- Supporting MOWRAM'S SEO to conduct screening and scoping of the subprojects, and identifying environment, social, land acquisition impacts and screening for presence of IPs in the subproject area.
- Liaising with village authorities in subproject area to encourage vulnerable groups to apply for jobs that may be offered by project's contractors.
- Collaborating with relevant departments involved in land acquisition and/or other environment or social mitigation measures.

8.1.2 NCDD'S PMU

NCDD's PMU will work closely with Provincial Cabinet in planning and implementing subproject located within their province. NCDD PMU will be responsible for day-to-day project implementation, monitoring and evaluation of Project Component 1, 2.1 and 2.2 in collaboration with MAFF. PMU will work under the oversight and guidance of NCDDS and will be responsible for all aspects of environmental and social performance, including E&S monitoring and evaluation, reporting of E&S performance, and relevant incidence during project implementation.

8.1.3 Provincial Department of Water Resources and Meteorology

PDWRAM's main responsibility includes:

During subproject preparation:

- Support design parties in their surveys and consultation to prepare Feasibility Study and Detailed Design for sub-scheme.

During construction:

- Oversee construction activities under Component 2, particularly construction of the new irrigation canal in the command area

During operation:

- Collaborate with other relevant technical departments, especially PDAFF at provincial level, farmer water user groups (FWUG) to ensure its regulators (located within the water distribution network) are operated effectively, and in a manner that minimizes water use conflicts among target water user community in the command area.
- Conduct regular maintenance of the reservoir and irrigation canals during subproject operation and maintenance stage.

8.1.4 Provincial Department of Agriculture, Forestry and Fisheries

PDAFF is responsible for implementing activities under Component 1, 2.1 & 2.2. Under this subproject, PDAFF is responsible for developing and implementing agricultural techniques that make full use of improved water access (under Component 1) to enable farmers in the command area to produce more food in a sustainable manner which improves farmers' income and livelihoods. PDAFF will focus on the following:

- Promoting crop diversification for farmers in the command area (e.g. crop rotation for rice and horticulture production improves soil conditions whereas enhancing vegetation production for household's better nutrition and income.
- Introducing to farmers new agricultural engineering techniques to promote a) mechanization to increase productivity in crop production (e.g. mechanization in soil preparation using laser land leveling, use of combine harvester to save labor and reduce production costs, b) save water by applying alternate wet and dry (AWD) and drip irrigation for horticultural activities, c) reduce GHG.
- Scaling up Crop Production and engaging Private Sector in value chain development for specific farm product (e.g. rice, bean, and other cash crops such as vegetables…) and relevant agricultural services through agricultural cooperatives, producer groups, etc.

8.2 Contractor's Environmental and Social Management Plan (C-ESMP)

The civil works contractor is responsible for implementing the Environmental and Social (E&S) mitigation measures outlined in this ESMP for Component 2, which involves constructing the irrigation canal and related structures like gates and regulators. Based on the ESMP and the project's Labour Management Plan (LMP), the contractor will:

- Prepare and submit a Contractor's Environmental and Social Management Plan (C-ESMP) for each contract, detailing how E&S risks related to construction activities, workers, camps, machinery, and vehicles will be mitigated. The C-ESMP must also include a labor management plan (C-LMP) and be site-specific, addressing risks based on the contractor's capacity and site conditions.
- If subcontractors are engaged, they must prepare their own E&S plan aligned with the ESMP and LMP, outlining how they will manage identified risks and impacts. Reporting arrangements between the subcontractor and the main contractor must be detailed, with the main contractor consolidating subcontractor reports into monthly E&S performance reports to the PMU, with quarterly reporting potentially required.
- If changes occur to the proposed works and activities during the contract period, the contractor must update the C-ESMP to reflect these changes, including relevant subcontractor plans. The C-ESMP should include:
    - A policy statement outlining the contractor's commitment to the site-specific ESMP.
    - Document details (issue date, revision status, distribution list, and signatures).
    - Applicable laws, regulations, and required permits.
    - Plans to manage E&S risks, including mitigation measures, a Workers' Code of

Conduct, and a Contractor's LMP.

- A list of required environmental and social training for all personnel, including occupational health and safety, SEA/SH/VAC risks, and emergency response.
- Financial resources and responsibilities for implementing the C-ESMP, including subcontractor responsibilities and training for local workers.
- Monthly environmental reports, covering accident/incident reporting within 48 hours to MoWRAM, compliance with the C-ESMP, challenges, non-compliance issues, subcontractor activities, and meeting minutes with MoWRAM.

The contractor must ensure timely funding, human resources, and implementation of pre-construction and construction mitigation measures, along with any additional E&S mitigation required.

8.3 Contractor's Safety, Social and Environmental Officer (SSEO)

The contractor must appoint a competent on-site Safety, Social, and Environment Officer (SSEO), trained in environmental management, to oversee contractors and subcontractor personnel. The SSEO's responsibilities include:

- Supervising subcontractor compliance with the Contractor's LMP and C-ESMP.
- Submit the LMP and C-ESMP to the PMU/DDIS for approval before mobilizing staff.
- Conducting site inspections and audits to ensure compliance with environmental and social mitigation measures.
- Monitoring and reporting on E&S compliance and preparing audit reports.
- Investigating complaints, recommending corrective actions, and addressing non-compliance.
- Informing the contractor, PMU, and DDIS of any E&S issues, and maintaining detailed records.
- Collaborating on labor issues and preparing the Contractor's LMP and C-ESMP, including OHS regulations.
- Maintaining employment records, verifying minimum working age, and ensuring signed Workers' Codes of Conduct.
- Providing regular training on occupational safety, SEA/SH/VAC, and community relations.
- Ensuring primary suppliers address SEA/SH/VAC, child labor, forced labor, and OHS risks.
- Developing and implementing a grievance mechanism for contracted workers, resolving grievances promptly, and reporting to the PMU.
- Ensuring all workers sign the Code of Conduct and implement measures to prevent SEA/SH.
- Developing and enforcing COVID-19 prevention and mitigation plans.

Incident reporting

The contractors are required to inform DDIS and PMU any incidents listed below within agreed timeframe (e.g. 48 hours):

- Any violations to national laws, regulations, or international agreements.
- Any serious accidents or fatalities,
- Significant impacts that cause losses to personal property such as traffic accidents, damages to local houses/roads and other incidents.
- Serious surface/ground water pollution.
- Failures of embankments at disposal sites that cause serious pollutions to the surroundings,
- Fire related to worker's behaviours,
- Any claims related to SEA/SH/VAC, or any other incidents related to children, and
- Receive a complaint about pollution or damages.

8.4 Contractor's obligation as to contractual requirements

The contractor and its subcontractors, if any, shall comply with the ESMP. In particular, the Contractor must prepare a Contractor's ESMP (C-ESMP) to elaborate this ESMP based on a) site condition, b) capacity of the Contractors and their subcontractors (if any), c) national regulations that are active by the time of subproject implementation.

To ensure that necessary action has been undertaken and that steps to avoid adverse impacts and/or reoccurrence have been implemented, the Project Manager, the Safeguard Focal Persons, and/or contractor must report to PMU within 48 hours of any serious incidents of non-compliance that may have serious consequence. In the event of working practices being deemed dangerous either by the subproject, the local authorities, or the other concerned agencies, immediate remedial action must be taken by the contractors. The contractor must keep records of any incidents and any corrective action taken. The records of non-compliance that could be practically addressed (not cause serious impacts) will be reported to the DDIS with a copy to PMU monthly.

The contractor will be responsible for dealing with any reports/grievance forwarded by the local communities, authorities, police or other agencies as soon as practicable, preferably within one hour but always within 48 hours. The Project Manager/Safeguard Focal Persons will monitor and ensure that the contractor has taken appropriate action. Where appropriate, approval of remedial actions may require an agreement from the local authorities and/or other government agencies. Procedures should be put in place to ensure, as far as is reasonably practical, that necessary actions can be undertaken to avoid recurrence and/or serious damage.

9. ENVIRONMENTAL AND SOCIAL MONITORING PROGRAM

9.1 Environmental Monitoring Program

To ensure the effectiveness of environmental management, the environmental monitoring program is prepared to monitor the environmental quality. The contractor and/or sub-contractor is responsible for monitoring using appropriate method, equipment and system. Details on monitoring parameters are shown in the table below:

Table 20: Environmental monitoring plan during construction phase

Monitoring Parameters	Monitoring Activities	Location	Measurements	Frequency	Responsibility
Soil quality	• Avoid construction activities in the rainy season and/or days of heavy rains. • Management activities of fuel, oils, and chemical substances. • Cover all restored areas with topsoil and re-vegetate	Construction site	• Site inspection • Visual observation	Daily	SEO E&S specialist consultants PMU
Air quality	• Spray or sprinkle water on the work surfaces and other piled materials to minimize dust at least 3-6 times per day in windy and dry weather and/or based on the weather condition • Solid waste or construction waste activities • Construction machinery operation and maintenance • Distance of sitting concrete mixing plants, crushing • plants, quarries and other facilities to settle and other sensitive receptors • Transportation of construction materials	Construction site	• Site inspection • Visual observation • Monitoring equipment and/or appropriate monitoring methods	Daily	SEO E&S specialist consultants PMU
	• Testing air quality (NO2, SO2, CO, TSP, PM10, PM2.5)	There is one location for air quality sampling: SS1 X: 465547 Y:1304414	• Air quality monitoring equipment	Every 06 months	
Noise	• Avoid working during night-time from 21:00 hours to 06:00 hours • Provide ear sets for workers to prevent noise if the noise level exceeds the standard • Check and maintain construction machinery regularly to avoid noise and high vibration • Restrict use of vibrating rollers and operation of heavy equipment near sensitive structures	• Construction site • Nearby sensitive structures	• Site inspection • Visual observation	Daily	SEO E&S specialist consultants PMU
	• Measuring noise and vibration level	There is one location for noise and vibration quality sampling: SS1 X: 465547	• Measuring equipment and/or appropriate	Every 06 months	SEO E&S specialist consultants PMU

Monitoring Parameters	Monitoring Activities	Location	Measurements	Frequency	Responsibility
		Y:1304414	monitoring methods		
	• Avoid construction activities in the rainy season and/or days of heavy rains. • Management activities of fuel, oils, and chemical substances. • Cover all restored areas with topsoil and re-vegetate	Construction site	• Site inspection Visual observation	Daily	SEO E&S specialist consultants PMU
Soil quality/ quality reduction	• Testing of soil quality is going to be analyzed in the agriculture context: - Soil classification or particle size, - Soil moisture, - Nitrogen (N), Phosphorus (P), Potassium (K), Magnesium (Mg), Sodium (Na), - Organic Metter - Ratio of the mass of carbon to the mass of nitrogen in organic residues (C/N Ratio), - Total phosphorus (P), - Cation exchange capacity (CEC), - pH, • Electrode Conductivity.	There is one location for soil quality sampling. SS X:465450 Y:1304887	• Soil quality monitoring equipment	Every 06 months	SEO E&S specialist consultants PMU
Water Quality	• Wastewater management • Design and capacity of septic tank • Digging of side drain at campsite • Construction of retaining structures	Construction site	• Site inspection • Visual observation	Daily	SEO E&S specialist consultants PMU

Monitoring Parameters	Monitoring Activities	Location	Measurements	Frequency	Responsibility
	Parameters for surface water quality test: • Depth • pH • Electrode Conductivity (EC) • Arsenic (AS) • Cadmium (Cd) • Lead (Pb) • Total Nitrogen (TN) • Total Phosphorus (TP) • Total Dissolved Solid (TDS) • Total Suspended Solid (TSS) • Dissolved Oxygen (DO) • Total Coliform	There is one location for surface water quality sampling: SW X: 465456 Y:1307467	• Water quality monitoring equipment		
	• Testing wastewater quality and pesticide residues in water (to be conducted overseas)	Final outlet from Septic Tank	Water quality monitoring equipment	Every 06 months	SEO E&S specialist consultants PMU
Solid waste/wastewater	• Solid and liquid waste management plan in the project construction sites. • Install septic tanks at the construction camp to prevent the discharge of polluted sewage into the outside. • Implement waste segregation of reusable construction materials, biodegradable, and non- biodegradable wastes. • Orient workers on the solid waste segregation system and prohibit them from indiscriminate throwing wastes outside of waste bins in the construction sites. • Provide sufficient waste bin and proper storage before transportation to dispose at an authorized landfill.	Construction site	• Site inspection Visual observation	Daily	SEO E&S specialist consultants PMU
Hazardous and non-hazardous waste	• Hazardous and Non-hazardous waste management strategies • Sludge management	Construction site	• Site inspection • Visual observation	Daily	SEO E&S specialist consultants PMU

Monitoring Parameters	Monitoring Activities	Location	Measurements	Frequency	Responsibility
	BIODIVERSITY		•		
Habitat Loss and Fragmentation	• Area of habitat lost or fragmented. • Changes in vegetation cover. • Number of isolated habitat patches • Presence of wildlife corridors.	Construction site	Site inspection Visual observation GIS analysis (if available) • Drone surveys (if available)	Daily/Weekly	SEO E&S specialist consultants PMU
Loss of biodiversity and ecosystem services	• Changes in species abundance and diversity • Decline in water quality • Changes in soil fertility • Reduced pollination services • Alterations in hydrological processes	Construction site	Site inspection Visual observation Biodiversity surveys •	Daily/Weekly	SEO E&S specialist consultants PMU
Hunting and trading, and consumption of wildlife	• Avoid cutting of trees or destruction of vegetation • No hunting, fishing, or collection of animal and plant materials • Revegetation success will be monitored, particularly surrounding riparian vegetation along area where levee is installed for flood protection and for increased water retention.	Construction site	Site inspection Visual observation • Community interviews	Daily/Weekly	SEO E&S specialist consultants PMU
Flora and Fauna	• Avoid cutting down trees or destruction of vegetation • No hunting, fishing, or collection of animal and plant materials • Construction of fish ladder passage • Revegetation success will be monitored, particularly surrounding riparian vegetation along area where levee is installed for flood protection and for increased water retention.	Construction site	• Site inspection • Visual observation	Daily	SEO E&S specialist consultants PMU
Destruction of farming ecosystem	• Area of farmland affected • Changes in crop yields • Impacts on livestock • Pollution of water sources used for irrigation	Construction site	Site inspection Visual observation • Interviews with farmers	Daily/Weekly	SEO E&S specialist consultants PMU
Landscape and biodiversity	• Adopting good housekeeping and good construction practices. • Ensuring proper lining of canals and adequate assembling of pipes	Construction sites	• Site inspection • Visual observation	Daily	SEO E&S specialist consultants

Monitoring Parameters	Monitoring Activities	Location	Measurements	Frequency	Responsibility
	• Avoid extraction of gravel from watercourses. • Adopting of slop stabilization techniques.				PMU
Protected Areas	• Exclude a subproject located in Zone 3 of the protected area.	Construction sites	• Site inspection	Daily	SEO
GHG emission	• Monitor the amount of fuel used by construction vehicles, heavy machinery, and generators. • Track the fuel efficiency of these machines to identify opportunities for improvement. • Assess the effectiveness of measures to control dust emissions from construction sites. • Monitor the types and quantities of waste generated and their disposal methods. • Track the amount of waste recycled or reused to reduce emissions associated with landfill disposal. • Monitor the number and types of vehicles entering and leaving the construction site. • Track the efficiency of transportation methods used to deliver materials and equipment.	Construction site Nearby sensitive structures	• Site inspection Visual observation Consultation	Daily	SEO E&S specialist consultants PMU
	DURING OPERATION PHASE				
Water Quality	Testing surface water quality (Depth, pH, EC, AS, Cd, Pb, TN, TP, TDS, TSS, DO, and Total Coliform) and pesticide residues in water (to be conducted overseas)	There is one location for surface water quality sampling: SW X: 465456 Y:1307467	Site inspection Visual observation	Annually	SEO E&S specialist consultants PMU
Soil quality/ quality reduction	• Testing of soil quality is going to be analyzed in the agriculture context: - Soil classification or particle size, - Soil moisture, - Nitrogen (N), Phosphorus (P), Potassium (K), Magnesium (Mg), Sodium (Na),	There is one location for soil quality sampling. SS X:465450 Y:1304887	Soil quality monitoring equipment	Annually	SEO E&S specialist consultants PMU

Monitoring Parameters	Monitoring Activities	Location	Measurements	Frequency	Responsibility
	- Organic Metter - Ratio of the mass of carbon to the mass of nitrogen in organic residues (C/N Ratio), - Total phosphorus (P), - Cation exchange capacity (CEC), - pH, - Electrode Conductivity.				
Biodiversity and Ecosystem Services	• Implementing Biodiversity Action Plan (BAP)	The entire sub-scheme	Site inspection Visual observation	Daily	SEO E&S specialist consultants PMU
Habitat Loss and Fragmentation	• Area of habitat converted for agricultural use • Changes in the size and connectivity of habitat patches • Number of isolated habitat fragments	The entire sub-scheme	Site inspection Visual observation	Annually	SEO E&S specialist consultants PMU
Hunting, trading, and consumption of animal from the wild	• Incidents of illegal hunting, trapping, or fishing • Presence of wildlife products for sale • Reports of wildlife consumption	The entire sub-scheme	Site inspection Visual observation Community interviews	Annually	SEO E&S specialist consultants PMU Local authorities
GHG emission	Monitor the Knowledge, Attitude and Practices of farmers in farming activities that cause GHG emission	The entire sub-scheme	Site inspection Visual observation Consultation	Daily	SEO E&S specialist consultants PMU
	ANNUAL CROP MANAGEMENT PLAN				
Water resource efficiency	• Monitor water extraction rates from surface and groundwater sources. • Assess irrigation efficiency by measuring the amount of water applied versus the amount of water actually used by crops. • Monitor the implementation and effectiveness of water-saving irrigation methods (drip irrigation, sprinkler irrigation, AWD for	Irrigation intake points Representative fields within the sub-scheme	Water flow measurements Soil moisture monitoring Crop water use assessments	Daily	PMU FWUC

Monitoring Parameters	Monitoring Activities	Location	Measurements	Frequency	Responsibility
	rice). • Track water consumption per unit of crop yield (e.g., cubic meters of water per ton of rice produced).				
Soil erosion and soil erosion risk	• Monitor soil erosion rates in different parts of the sub-scheme, particularly in sloping areas. • Assess the effectiveness of erosion control measures (contour planting, terracing, grass barriers). • Monitor soil organic matter content as an indicator of soil health and erosion resistance.	Representative fields Areas with different slopes and soil types	• Visual assessments of erosion features (gullies, rills) • Soil loss measurements using erosion plots or sediment traps • Soil organic matter analysis	After significant rainfall events Annually	PMU Agricultural extension officers
Nutrient application and management	• Monitor the types and amounts of fertilizers applied to different crops. • Conduct regular soil testing to assess nutrient levels and guide fertilizer application rates. • Monitor nutrient runoff from fields, especially near watercourses.	Representative fields Water sampling points near fields	• Fertilizer application records • Soil nutrient analysis • Water quality testing for nutrients (nitrogen, phosphorus)	Before and after fertilizer application Regularly during the growing season	PMU Farmers
Use and effectiveness of pesticides	• Monitor the types and amounts of pesticides used for different crops and pests. • Assess the effectiveness of pest control measures by monitoring pest populations and crop damage. • Track the incidence of pesticide-related health issues among farmers and workers.	Representative fields Pesticide storage facilities	• Pesticide application records • Pest scouting and monitoring data • Health records	Regularly during the growing season	PMU Agricultural extension officers
Pesticide residues on site soil	Conduct soil sampling and analysis to measure pesticide residue levels in representative fields.	Representative fields Areas near pesticide storage facilities	• Soil residue analysis	Periodically (e.g., annually or before planting sensitive crops)	PMU Third-party laboratories

Monitoring Parameters	Monitoring Activities	Location	Measurements	Frequency	Responsibility
Pesticide residues on produce	• Collect and analyze samples of produce to determine pesticide residue levels. • Ensure that produce meets national and international standards for maximum residue limits (MRLs).	Representative fields at harvest time	• Laboratory analysis of produce samples	Before harvest	PMU Third-party laboratories
Energy use	• Monitor fuel consumption for machinery and equipment used in farming operations. • Track electricity usage for irrigation pumps and other energy-consuming activities. • Assess the efficiency of energy use by calculating energy consumption per unit of crop yield.	Fuel storage facilities Irrigation pump stations	• Fuel consumption records • Electricity meter readings	Regularly (e.g., monthly or seasonally)	PMU

9.2 Social Monitoring Program

To ensure the effectiveness of social management, the social monitoring program is prepared to monitor social issues. The contractor and/or sub-contractor are responsible for monitoring using appropriate methods, equipment and system. Details on monitoring parameters are shown on the table below:

Table 21: Social monitoring plan during construction and operational phase

10. ESTIMATED COSTS

10.1 Estimated Costs for ESCMP Implementation

The costs of implementing the ESCMP listed below are related to PMU costs in addition to the dedicated safeguards PMU personnel budget line item. The main costs of implementing this ESCMP are the additional cost which have not been budgeted within the project, exclusive of the actual budget for the land resettlement and land acquisition which will be estimated by the end of the year as per the newly approval on the final conceptual design. For example, the project component 1 focus on establishment, capacity building and strengthening the FWUCs, therefore the concern regarding water management and water distribution inequality have already covered. Moreover, the sustainable agricultural practices and agricultural value chain is already in the project action plans. In this regard, the concern regarding GHG emission from the farming activities have been already addressed. The proposed budget therefore is the additional cost which are added to the existing one.

Table 22: Estimated cost for ESCMP implementation

No.	Items	Qty	Unit	Cost (USD)	Total (USD)
1	UXO clearance	Lum-sump	1	50,000	50,000
2	Land Acquisition and Land Impact Assessment and the preparation of the Land Acquisition and Land Resettlement Plan	Lum-sump	1	15,000	15,000
3	Implementing Biodiversity Management Plan	Year	5	7,500	37,500
4	ESCMP awareness raising and sensitization with key stakeholders and communities (5 times)	Times	2	3,000	6,000
5	Community outreach at the project area	Sub-scheme	1	15,000	15,000
6	Consultation facilitation	Sub-scheme	1	10,000	10,000
7	Monitoring activities	Lum-sump	1	18,500	18,500
	Total				**152,000**

10.2 Estimated Costs for ESMCP Monitoring Program

The monitoring cost will be budgeted only for the activities which are supposed to be additional expenditure which are not included in the social and safeguard consultant. The cost for monitoring is mainly focused on the monitoring cost for soil, water, and air quality.

Table 23: Estimated cost for ESCMP monitoring program

No.	Items	Unit	Qty	Cost	Total
1	Soil quality monitoring (every six months* 1 location * 1.5 year)	Times	3	1,500	4,500
2	Air quality, noise and vibration quality monitoring (every six months * 1 locations * 1.5 year)	Times	3	2,000	6,000
3	Water Quality monitoring (every six months* 1 location * 1 year) and groundwater (Annually * 1 location * 1 year) for around half of the total sample for surface water	Times	4	2,000	8,000

No.	Items	Unit	Qty	Cost	Total
	Total				**18,500**

Annex

Annex 1 – Screening checklist for E&S impacts for each sub-scheme

Circle screening conclusion:

- If the answers to the checklist questions are “No”, there is no need for further action.
- If the answers to the questions are “Yes”, then consult the relevant procedures /guidelines for assistance inaddressing issues of concerns.

A	Environmental and Social Impacts	No	Yes	Notes
Location				
1	Are there environmentally sensitive areas (forests, pastures, rivers, and wetlands) or threatened species that could be adversely affected by the sub-project?			
2	Does the sub-project area (or components of the project) occur within or adjacent to any protected areas designated by government (national park, national reserve, world heritage site, etc.)?			
3	If the sub-projects are outside of, but close to, any protected area, is it likely to adversely affect the ecology within the protected areas (e.g., interference with the migration routes of mammals, fish, or birds)?			
4	Will the sub-projects reduce people’s access to pasture, water, public services, or other resources that they depend on?			
5	Might the sub-projects alter any historical, archaeological, or cultural heritage site or require excavation near such a site?			
Physical and biological environment				
6	Will projects require large volumes of construction materials (e.g. gravel, stones, water, timber, firewood)?			To build rehabilitate irrigation canals and dam
7	Might the projects lead to soil degradation or erosion in the area?			
8	Might the projects affect soil salinity?			
9	Will the projects create solid or liquid waste that could adversely affect local soils, vegetation, rivers, streams, or groundwater?			
10	Might river or stream ecology be adversely and remarkably affected due to the installation of structures such as weirs, etc.?			
11	Will the projects have adverse impacts on natural habitats that will not have acceptable mitigation measures?			
12	Do the projects have human health and safety risks, during			OHS safety and Dam

	construction or later?			safety
13	Might the projects lead to migration into the area?			
Alternatives				
14	Is it possible to achieve the objectives above in a different way, with fewer environmental and social impacts?			
B	**Land Acquisition and Social Issues**			
1	Have all groups within the community been consulted about the proposed project?			
2.	Which groups have not been consulted?			
3	Will the projects require acquisition of land (public or private) and/or other assets for its development?			
4	Will anyone be prevented from using economic resources (e.g. pasture, community place, forests etc.) to which they have had regular access?			
5	Will the projects result in the involuntary resettlement of individuals or families?			
6	Will the projects result in temporary or permanent loss of crops, fruit trees and household infrastructure such as granaries, toilets, kitchens etc.?			
7	Will the projects affect the livelihoods of particular groups within the communities, especially vulnerable groups such as the landless?			
8	Will the projects affect the well-being and livelihoods of women, particularly female-headed households?			
9.	Will the projects benefit all groups within the community equally?			
10.	Are there ongoing land or water disputes within the community/with neighboring communities?			
C	**Pesticides and Waste Materials**			
1	Will the project result in the introduction of pesticides or an increase of pesticide use if use of such products currently exists?			
2	Will the project result in the production of solid or liquid waste (e.g. water, domestic or construction waste), or result in an increase in waste production during construction or operation?			
D	**Is there a probability of the presence of unexploded ordinance (UXO) at or near the proposed sub-project area?**			

1.1 Summary of Consultation with project Stakeholders

This section summarizes four consultation rounds carried out during the project preparation phase. These consultations involved discussions with relevant institutions, non-governmental organizations, local authorities, and local communities throughout the preparation process. The data collection and consultations were conducted in four periods:

1.1.1 First consultation

- The first consultation was conducted between 26 and 28 July 2024 to capture information regarding biodiversity and environmental condition in the project area.

1.1.2 Second consultation

- The second consultation was conducted to consult with forestry and fishery communities, local authorities and key informants to understand the situation and concerns related to the presence of the project. The consultation was conducted between 03 and 09 August 2024.

1.1.2.1 Result of consultation

- Krapeu Trom is situated within the same river catchment area in the lower reaches, near the Tonle Sap's annual floodplain. The reported endangered species in this sub-scheme is the Isok barb/Jullien's Golden Carp (Probarbus jullieni) being seen once in 2022, approximately 500 meters downstream of the reservoir facility during a flooding event. The community people reported that the species migrated upstream from the Tonle Sap during the flood season but became trapped in spillways. They added that if flooding is insufficient, fish populations decline, and rare species may no longer be present in the area.

1.1.2.2 Proposed project activities

Some potential project activities to address habitat conservation and species protection in Krapeu Trom:

Habitat Assessment and Monitoring:

- Baseline Survey: Conduct a comprehensive baseline survey to assess the current state of the habitat, including water quality, vegetation cover, and fish populations.
- Habitat Mapping: Create detailed maps of the sub-scheme, identifying key habitats, potential threats, and areas for conservation.
- Long-Term Monitoring: Establish a long-term monitoring program to track changes in habitat conditions, fish populations, and the effectiveness of conservation measures.

Habitat Restoration and Improvement:

- Riverine Habitat Restoration: Restore degraded riverine habitats by removing obstructions, improving water quality, and promoting riparian vegetation.
- Wetland Restoration: Create or restore wetlands to provide critical habitat for fish and other aquatic species.
- Floodplain Management: Implement measures to maintain the natural flood regime and protect floodplain habitats.
- Fish Population Assessment and Conservation:
- Fish Surveys: Conduct regular fish surveys to assess the abundance, distribution, and health of targeted fish species.
- Population Enhancement: If necessary, implement population enhancement measures, such as captive breeding and restocking.
- Habitat-Based Conservation: Focus on habitat-based conservation measures to support fish populations, including improving water quality, restoring spawning grounds, and reducing threats from fishing and pollution.

Community Engagement and Awareness:

- Community Workshops: Organize workshops to educate local communities about the

importance of habitat conservation and sustainable fishing practices.

- Community-Based Monitoring: Involve local communities in habitat monitoring and data collection.
- Alternative Livelihoods: Support the development of alternative livelihoods for local communities to reduce dependence on unsustainable fishing practices.

1.1.3 Third consultation

- The third consultation was conducted at household, village, and commune level stakeholders focusing on status, concerns and feedback regarding the project implementation. This consultation was conducted between 10 and 18 August 2024.
- Overall, it is apparent that in the sub-schemes contain young population indicating its high potential in future development activities. Agriculture was reported as the main occupation of the population within the command areas. While business and service are the second highest proportion. As for secondary occupations, full-time workers were dominant among the population while rice and crop production accounting for the second largest proportion. A notable 4% of the population falls under poor categories 1 and 2, reflecting the economic conditions of the areas. The proportion of people with disabilities (PWD) stands at 1.1%. Additionally, the total migration rate is 13%, with all migrations occurring domestically.
-

Figure 1. Focus Group Discussion with Rice Farmers

Table 1. List of participants of KII and FGD in Krapeu Truom Command area

No	Name	Sex	Position	Commune	District
Key Informant Interview					
1	Mao Mon	M	Commune Council	Veal Pong	Oudong Mae Chey
2	Sorn Sem	M	Commune Council	Veal Pong	Oudong Mae Chey
3	Toem Sanu	M	Commune Council	Preh Srae	Oudong Mae Chey
4	Chhay Em	M	Commune Council	Preh Srae	Oudong Mae Chey
5	En Thy	M	Commune Council	Preh Srae	Oudong Mae Chey
6	Huy Seng	M	Commune Council	Preh Srae	Oudong Mae Chey
7	Thoy Voan	M	Village Chief	Veal Pong	Oudong Mae Chey
8	Oam Phorn	M	Village Chief	Veal Pong	Oudong Mae Chey
9	Kroun Thiem	M	Deputy Village Chief	Veal Pong	Oudong Mae Chey
10	Kuy Cheun	M	Village Chief	Preah Srae	Oudong Mae Chey
Focus Group Discussion					

1	Thiem Lida	F	Vegetable Farmer	Veal Pong	Oudong Mae Chey
2	Soung Lang	F	Vegetable Farmer	Veal Pong	Oudong Mae Chey
3	Nom Sarorn	F	Vegetable Farmer	Veal Pong	Oudong Mae Chey
4	Khut Chou	M	Vegetable Farmer	Veal Pong	Oudong Mae Chey
5	Mith Rien	M	Vegetable Farmer	Veal Pong	Oudong Mae Chey
6	Kroun Theam	M	Vegetable Farmer	Veal Pong	Oudong Mae Chey
7	Soung Som	M	Vegetable Farmer	Veal Pong	Oudong Mae Chey
8	Soun Sokny	F	Vegetable Farmer	Veal Pong	Oudong Mae Chey
9	Muth Chanthoeurn	F	Vegetable Farmer	Veal Pong	Oudong Mae Chey
10	Khloeng Sophann	F	Vegetable Farmer	Veal Pong	Oudong Mae Chey
11	Khon Soeurn	F	Vegetable Farmer	Veal Pong	Oudong Mae Chey
12	Penh Sary	F	Vegetable Farmer	Veal Pong	Oudong Mae Chey
13	Toun Pov	F	Vegetable Farmer	Preah Srae	Oudong Mae Chey
14	Phan Savin	F	Vegetable Farmer	Preah Srae	Oudong Mae Chey
15	Sin Sophanny	F	Vegetable Farmer	Preah Srae	Oudong Mae Chey
16	Chan En	F	Vegetable Farmer	Preah Srae	Oudong Mae Chey
17	Chan Orn	F	Vegetable Farmer	Preah Srae	Oudong Mae Chey
18	Sieng Chaneng	F	Vegetable Farmer	Preah Srae	Oudong Mae Chey
19	Uon Srey	F	Vegetable Farmer	Preah Srae	Oudong Mae Chey
20	Uong Muon	M	Vegetable Farmer	Preah Srae	Oudong Mae Chey
21	Thiem Lida	F	Rice Farmer	Veal Pong	Oudong Mae Chey
22	Soung Lang	F	Rice Farmer	Veal Pong	Oudong Mae Chey
23	Nom Sarorn	F	Rice Farmer	Veal Pong	Oudong Mae Chey
24	Khut Chou	M	Rice Farmer	Veal Pong	Oudong Mae Chey
25	Mith Rien	M	Rice Farmer	Veal Pong	Oudong Mae Chey
26	Kroun Theam	M	Rice Farmer	Veal Pong	Oudong Mae Chey
27	Soung Som	M	Rice Farmer	Veal Pong	Oudong Mae Chey
28	Soung Sophal	F	Rice Farmer	Veal Pong	Oudong Mae Chey
29	Phat Rorn	F	Rice Farmer	Veal Pong	Oudong Mae Chey
30	Soy Chandy	F	Rice Farmer	Veal Pong	Oudong Mae Chey
31	Rin Channeang	F	Rice Farmer	Veal Pong	Oudong Mae Chey
32	Soy Ny	M	Rice Farmer	Veal Pong	Oudong Mae Chey
33	Khem Yeun	F	Rice Farmer	Veal Pong	Oudong Mae Chey
34	Youn Pao	F	Rice Farmer	Preah Srae	Oudong Mae Chey
35	Phan Sary	F	Rice Farmer	Preah Srae	Oudong Mae Chey
36	Sin Sophanny	F	Rice Farmer	Preah Srae	Oudong Mae Chey
37	Sieng Chanthol	F	Rice Farmer	Preah Srae	Oudong Mae Chey
38	Chan Orn	F	Rice Farmer	Preah Srae	Oudong Mae Chey
39	Oun Srey	F	Rice Farmer	Preah Srae	Oudong Mae Chey
40	Uong Muon	M	Rice Farmer	Preah Srae	Oudong Mae Chey
41	Roeurn Siem	F	Chicken Farmer	Veal Pong	Oudong Mae Chey
42	Khen Sokha	F	Chicken Farmer	Veal Pong	Oudong Mae Chey
43	Son Saoly	F	Chicken Farmer	Veal Pong	Oudong Mae Chey
44	Kann Tonglim	F	Chicken Farmer	Veal Pong	Oudong Mae Chey
45	Phorn Sophal	M	Chicken Farmer	Veal Pong	Oudong Mae Chey
46	Sorn Siengly	M	Chicken Farmer	Veal Pong	Oudong Mae Chey
47	Dong Duy	M	Chicken Farmer	Veal Pong	Oudong Mae Chey
48	Hai Venghong	M	Chicken Farmer	Veal Pong	Oudong Mae Chey
49	Chey Say	F	Chicken Farmer	Veal Pong	Oudong Mae Chey
50	Phat Rorn	F	Duck Farmer	Veal Pong	Oudong Mae Chey

51	Soy Chandy	F	Duck Farmer	Veal Pong	Oudong Mae Chey
52	Rin Channeang	F	Duck Farmer	Veal Pong	Oudong Mae Chey
53	Soy Ny	M	Duck Farmer	Veal Pong	Oudong Mae Chey
54	Khem Yeun	F	Duck Farmer	Veal Pong	Oudong Mae Chey
55	Loeurn Samhak	M	Duck Farmer	Veal Pong	Oudong Mae Chey
56	Tut Chanthoeurn	F	Duck Farmer	Veal Pong	Oudong Mae Chey
57	Khloeng Sophann	F	Duck Farmer	Veal Pong	Oudong Mae Chey
58	Penh Sary	F	Duck Farmer	Veal Pong	Oudong Mae Chey
59	Soun Sokny	F	Duck Farmer	Veal Pong	Oudong Mae Chey

1.1.4 Fourth consultation

The last consultation was conducted between 21 and 23 August 2024 with the district and provincial stakeholders, mainly focusing on the opinion, and feedback regarding the implementation of the project.

1.1.4.1 Environment and Biodiversity Component

1.1.4.1.1 Pollution prevention and resource efficiency

Concerns

- The construction process can release dust, which will disturb the local community and surface water quality.
- The disposal of solid, liquid, and domestic waste from the workers at the irrigation construction site will negatively impact local air quality and surface water.

Feedback and Suggestions

- Regularly watering on the road transports construction materials and soil to reduce dust that may disturb nearby residents.
- Install garbage bins and waste storage areas in the construction sites and conduct orientation workers to put the waste in the garbage bins.

1.1.4.1.2 Biodiversity

Concerns

- The fish populations in command areas may decrease due to disrupting the natural flow of water and the impact on their habitats from the implementation of the reirrigation infrastructure and canal upgrading.

Feedback and Suggestions

- The project should avoid construction activities and improve irrigation on fish and aquatic habitats.
- Prevent damage from the construction activities to biodiversity, habitats, and other environmental components.
- Maintain existing large trees along the dam and canal within the sub-schemes during the reirrigation and upgrading process.

1.1.4.1.3 GHG emission

Concerns

- Climate change is negatively impacting rice production, causing problems such as increased disease, insect infestations, and extended dry seasons,

Feedback and Suggestions

- Installing solar water pumps in agriculture processing facilities can reduce fuel consumption, which causes greenhouse gas emissions.

1.1.4.2 Social Component

1.1.4.2.1 Labor and Working Conditions

Concerns

- The presence of construction staff and workers could lead to gender-based violence affecting women workers, women and children in the community.

Suggestions

- Should offer training to their staff and workers on gender issues, violence, and legal protections.
- Preventive support measures should also be put in place to stop abuse, and any incidents must be swiftly handled to avoid repetition. The training should be conducted by technical officers.

1.1.4.2.2 Community Health and Safety

Concerns

- Concerns about the presence of workers could cause sexual abuse of women and children living near the project site

Suggestions

- To prevent incidents, construction staff should regularly place warning signs and water the roads, as well as schedule construction times to minimize noise pollution that could disrupt the community and notify authorities upon project completion to avoid quiet handovers.

1.1.4.2.3 Land acquisition, economic and physical displacement

Concerns

- Landowners along the irrigation system without land registration are concerned they may not receive compensation due to the lack of title deeds.
- Conflicts between the project and affected families could emerge, often fuelled by external instigators rather than the families themselves.

Suggestions

- A preliminary study on land issues before construction is recommended, with each sector addressing specific aspects of land impact and conducting evaluations for each affected property.
- The project/construction company must collaborate with local authorities to resolve land-related issues, and compensation should be provided to landowners affected by the project.
- The construction company should submit quarterly monitoring reports on implementation activities to the provincial department to identify and quickly resolve any issues.

- The government is requested to assist in issuing land titles to farmers with land adjacent to streams and canals.

1.1.4.2.4 Cross–cutting risks and impacts

Concerns

- Provincial department facing of limited budget to develop and rehabilitate the existing irrigation system

Suggestions

- The project should thoroughly examine the technical and situational aspects of the sub-scheme before construction to prevent water shortages or flooding post-construction, and it should be implemented promptly.
- Establish a Farmer Water User Group (FWUG) to oversee water use and maintenance by providing technical and management training, materials supported to effectively control and manage water distribution.
- The water consumption fee should be gathered from farmer which could be used later to support caretaker and maintenance the irrigation system.

1.1.4.2.5 Agricultural Production

Concerns

- The high cost of agricultural inputs continues to reduce farmers' profits.
- Climate change is negatively impacting rice production, causing problems such as increased disease, insect infestations, and extended dry seasons.
- Manure for fertilizer is declining due to reduced animal raising and lower cattle prices are prompting farmers to reduce livestock raising.

Suggestions

- Build more water storage and reservoir which able to store more water
- The irrigation should be constructed based on technical and water conditions in the area.
- Utilizing durable concrete for the canal system can improve the efficiency and longevity of the irrigation infrastructure.
- Installing and upgrading damaged sluice gates in both main and secondary canals can improve water distribution efficiency and prevent water loss in agricultural production and reirrigation systems.
- Construct both side roads along the canal to enhance transportation for farmers and traders.

Table 1. List of participants during the fourth consultation meeting

No	Name	Sex	Position	Organization
1	Chet Dom	M	Deputy Head	Kampong Speu Provincial Administration
2	Prak Leakkhina	F	Deputy Head	Kampong Speu Provincial Administration
3	Chea Hokly	M	Officer	DAFF
4	Huong Eksamnang	M	Officer	DoWRM
5	Phun Phin	M	Deputy Director	DoWA
6	Koy Sonin	M	Deputy Director	DoE
7	Vann Sambath	M	Director	Svay Kravan Disabled People's Federation Organization

No	Name	Sex	Position	Organization
8	Chea Ratha	M	Director	Koung Pisei Integrated Agricultural Community
9	Kong Sophannak	M	Deputy District Governor	Oudong Mae Chey Town Hall
10	Keo Borey	M	Head of Office	Oudong Mae Chey Town Hall
11	Yoeng Soyen	M	Head of Office	Oudong Mae Chey Town Hall
12	Mak Samoeurn	M	Deputy Head of Office	Oudong Mae Chey Town Hall
13	Sok Khanit	F	Head of Social Office	Oudong Mae Chey Town Hall
14	Um Vann	M	Head of Admin Office	Oudong Mae Chey Town Hall

Figure 2: Consultation with Provincial Officers, Kampong Speu Province

Figure 3: Consultation with Provincial Department of Water Resources and Meteorology, Kampong Speu Province

Figure: Consultation with Krong Odoung Mae Chey, Kampong Speu Province

Annex 2: Layout of Krapeu Trom sub-scheme

Figure 1. Administrative map of Stung Krang Ponley sub-command area

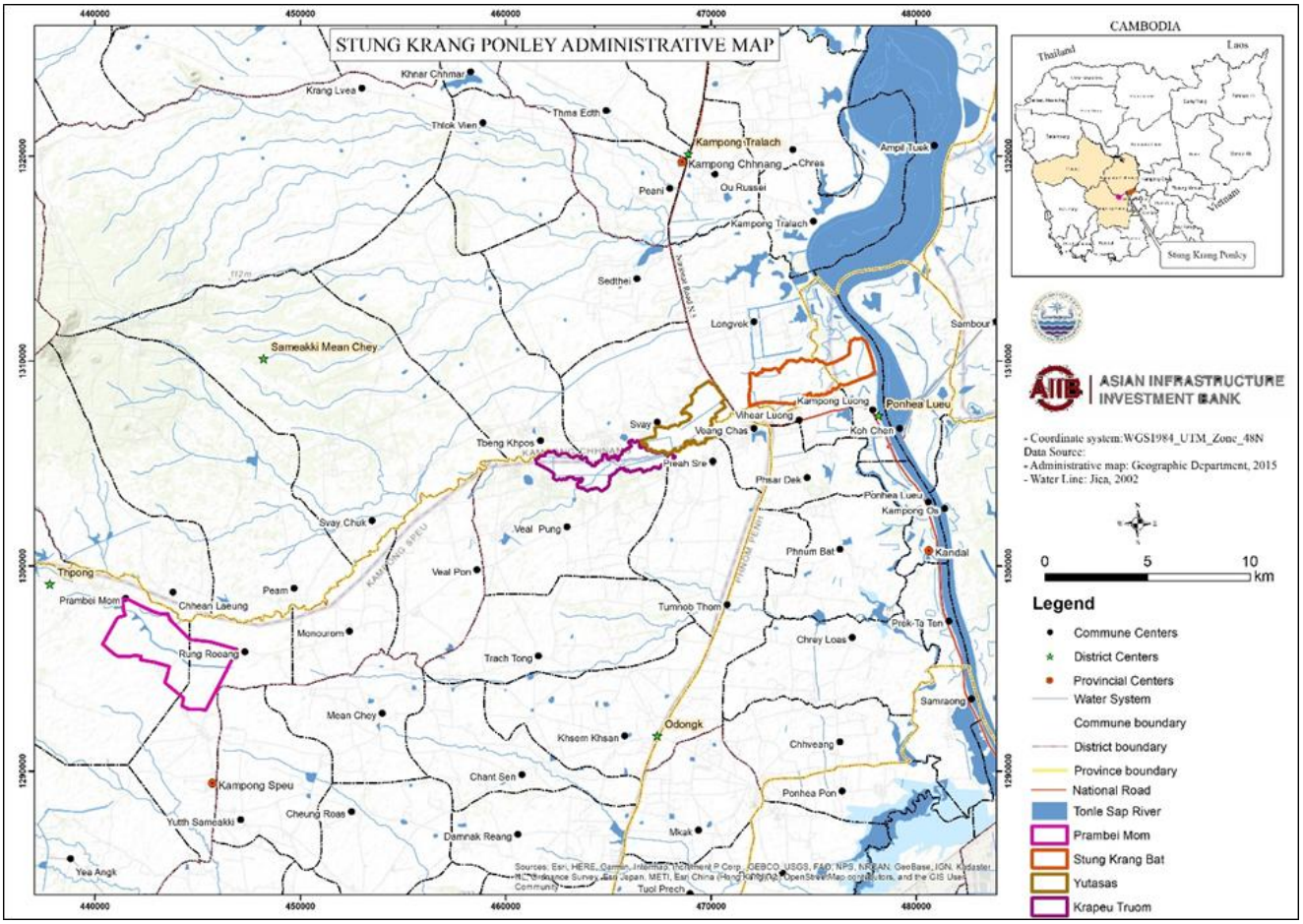


Figure 2. Length from Krapeu Trom to another of Krang Ponley sub-scheme and water source

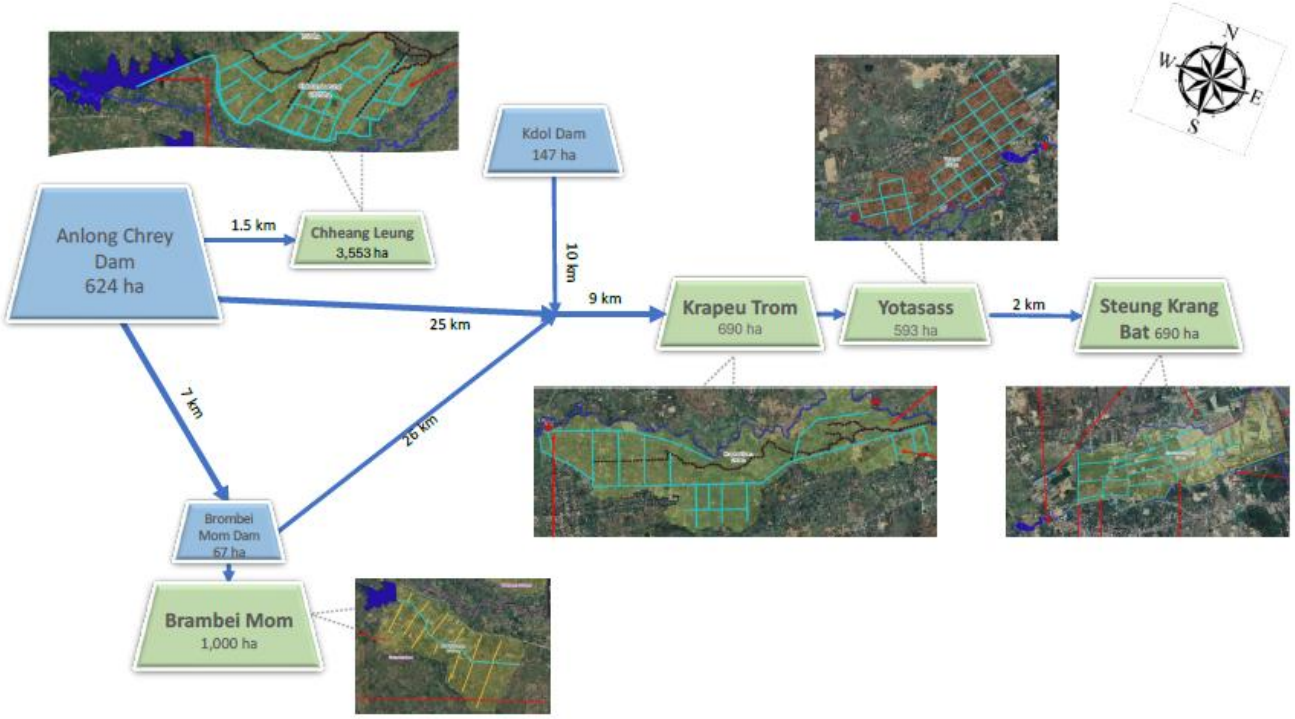


Figure 3. Concept design of irrigation of Krapeu Trom sub-scheme

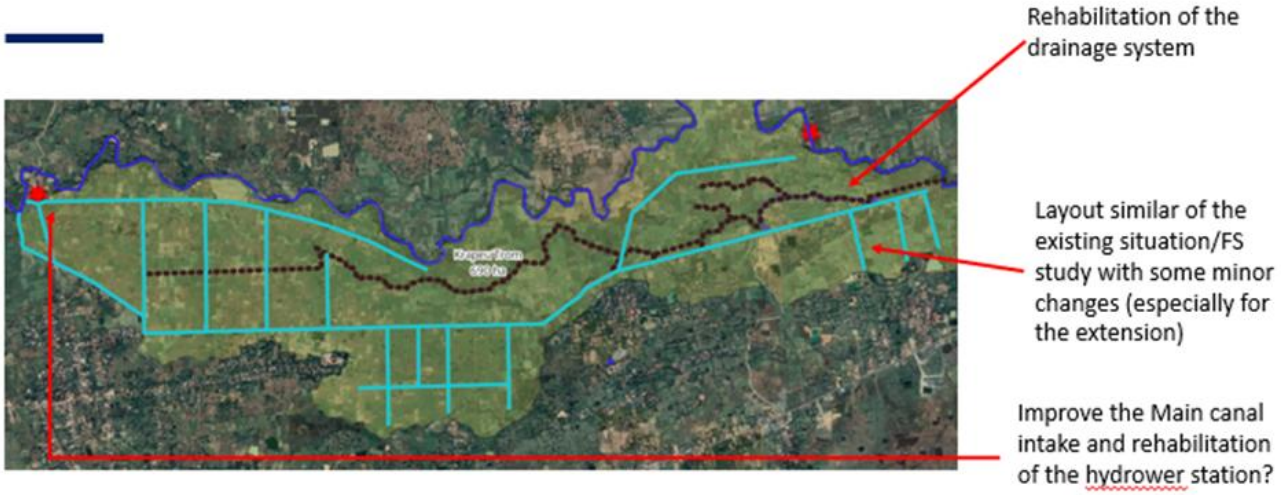


Figure 4. Map of construction sites and residential rea in Stung Krang Ponley

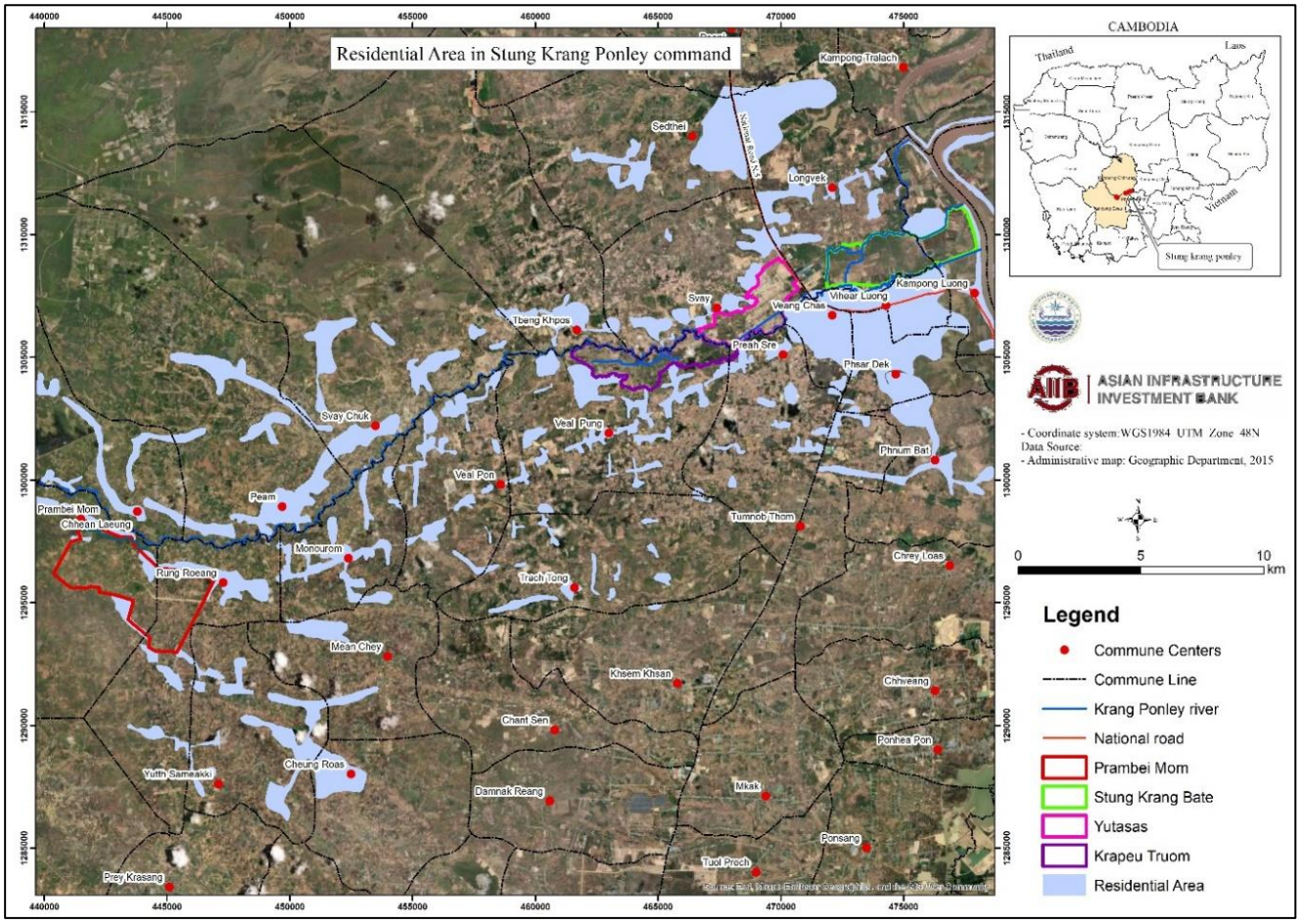
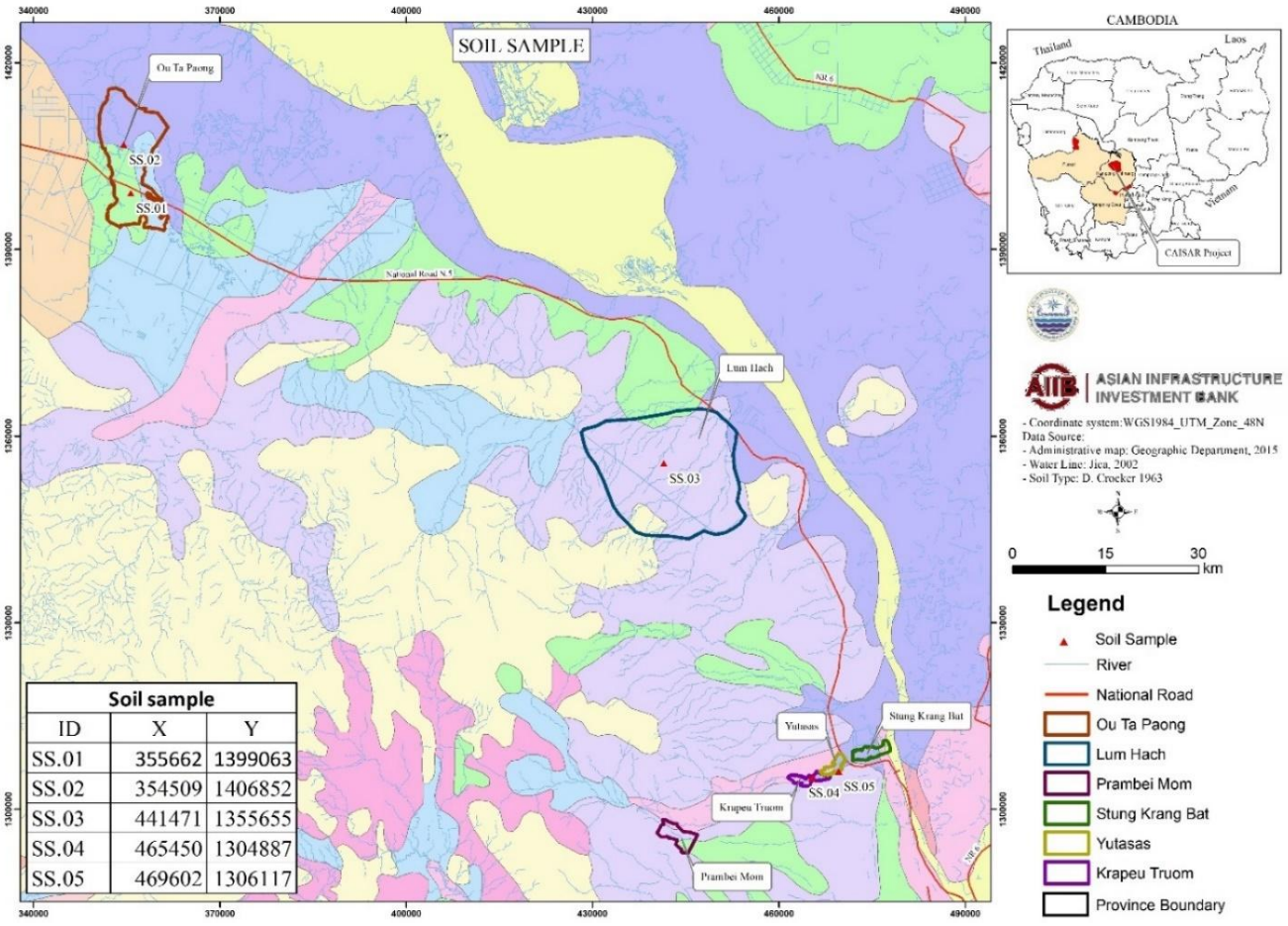
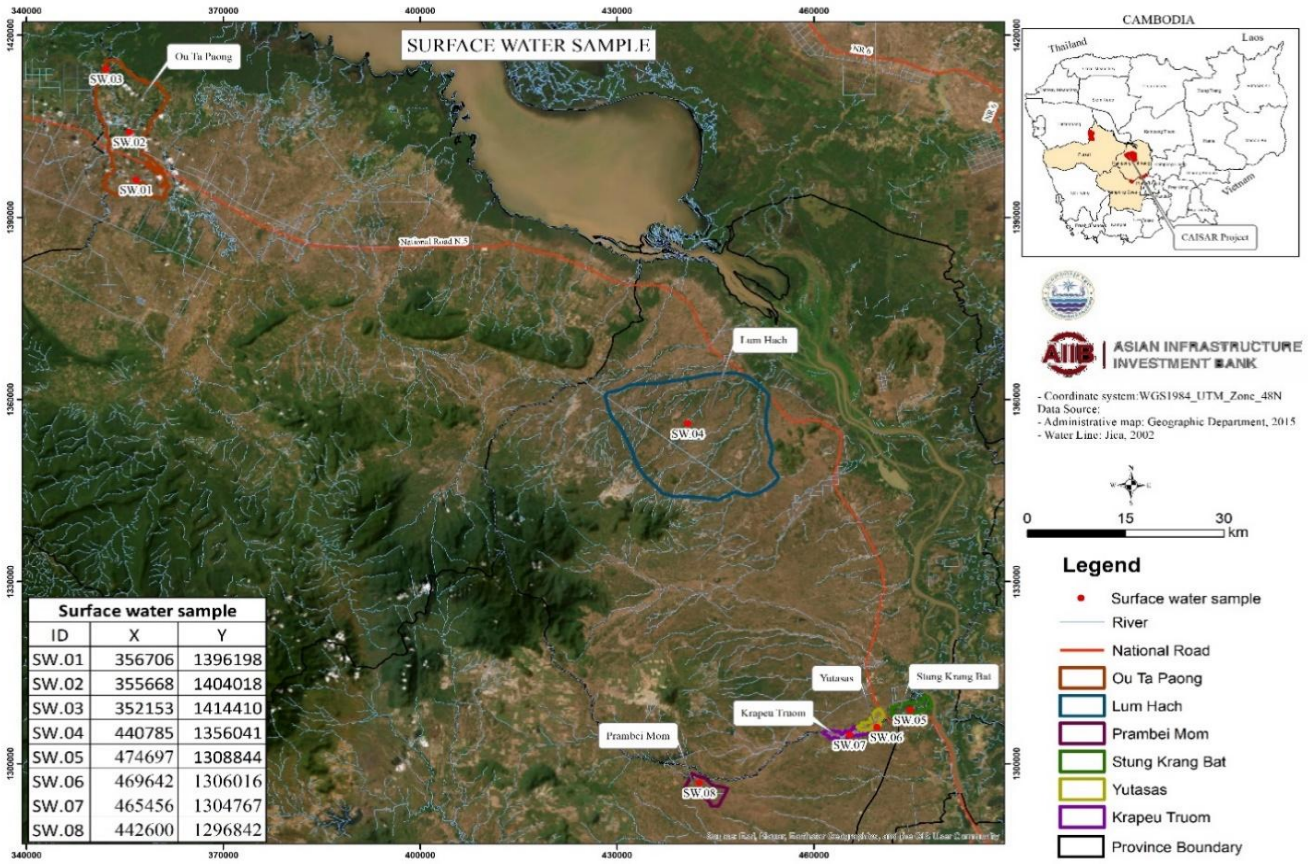


Figure 5. Location of soil sample selection in all sub-scheme under CAISAR project



Soil sample		
ID	X	Y
SS.01	355662	1399063
SS.02	354509	1406852
SS.03	441471	1355655
SS.04	465450	1304887
SS.05	469602	1306117

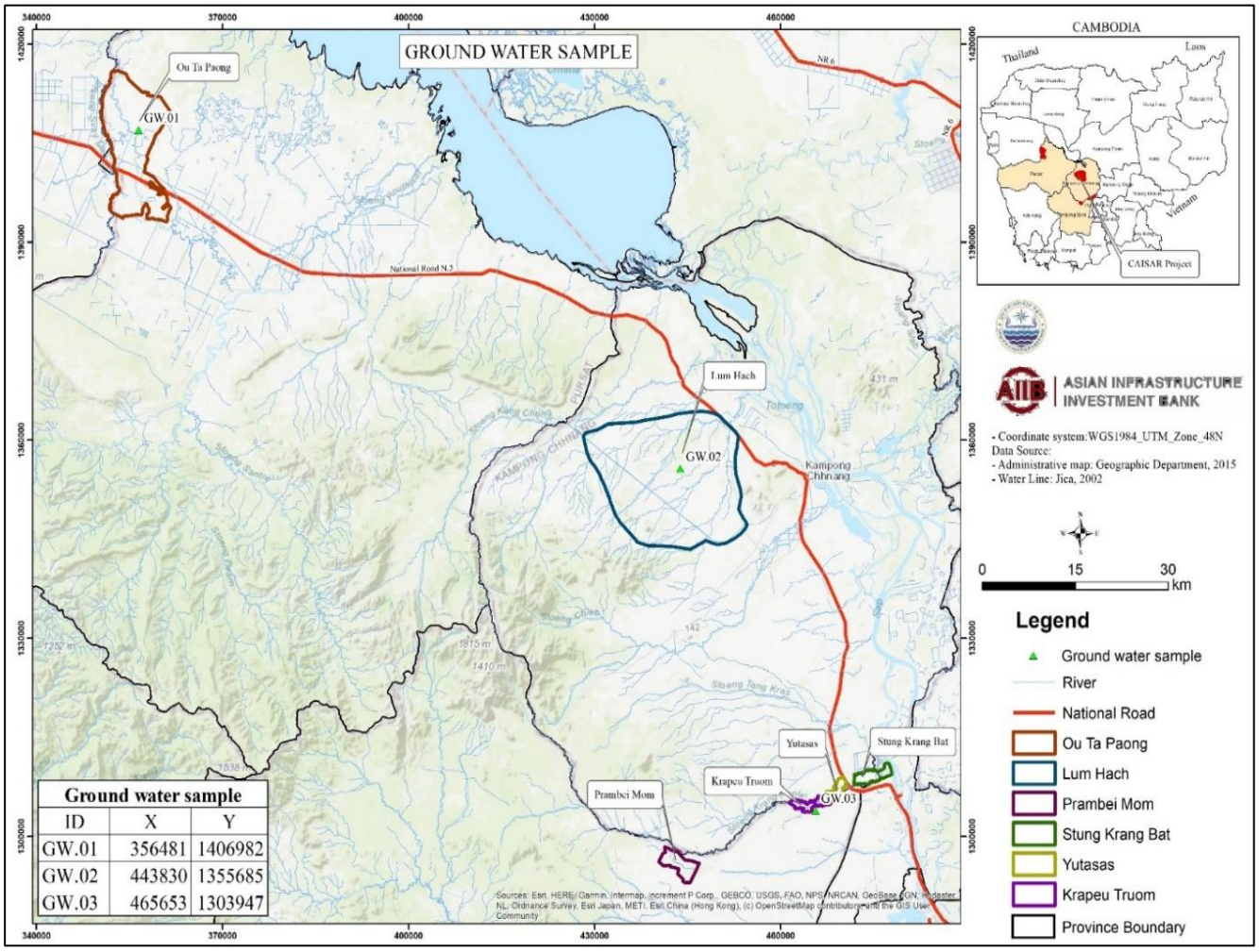
Figure 6. Location of surface water sample selection



Surface water sample

ID	X	Y
SW.01	356706	1396198
SW.02	355668	1404018
SW.03	352153	1414410
SW.04	440785	1356041
SW.05	474697	1308844
SW.06	469642	1306016
SW.07	465456	1304767
SW.08	442600	1296842

Figure 7. Map of groundwater sampling locations


GROUND WATER SAMPLE
Ou Ta Paong
GW.01
Lum Hach
GW.02
Kampong Chhnang
Yutasas
Stung Krang Bat
Krapeu Truom
GW.03
Prambei Mom
National Road N.5
NR 6
Ground water sample
ID X Y
GW.01 356481 1406982
GW.02 443830 1355685
GW.03 465653 1303947
CAMBODIA
Thailand
Laos
Vietnam
CAISAR Project
ASIAN INFRASTRUCTURE INVESTMENT BANK
- Coordinate system:WGS1984_UTM_Zone_48N
Data Source:
- Administrative map: Geographic Department, 2015
- Water Line: Jica, 2002
0 15 30 km
Legend
Ground water sample
River
National Road
Ou Ta Paong
Lum Hach
Prambei Mom
Stung Krang Bat
Yutasas
Krapeu Truom
Province Boundary

Annex 3 – Grievance Monitoring Logbook

1.1 Reportable Incidents

The following incident types are to be reported using the environmental and social incident response process.

- **Fatality**: Death of a person(s) that occurs within one year of an accident/incident including from occupational disease/illness (e.g., from exposure to chemicals/toxins).
- **Lost Time Injury**: Injury or occupational disease/illness (e.g., from exposure to chemicals/toxins) that results in a worker requiring 3 or more days off work, or an injury or release of substance (e.g., chemicals/toxins) that results in a member of the community needing medical treatment.
- **Acts of Violence/Protest**: Any intentional use of physical force, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, deprivation to workers or project beneficiaries, or negatively affects the safe operation of a project worksite.
- **Disease Outbreaks**: The occurrence of a disease in excess of normal expectancy of number of cases. Disease may be communicable or may be the result of unknown etiology.
- **Child Labor:** An incident of child labor occurs: (i) when a child under the age of 14 (or a higher age for employment specified by national law) is employed or engaged in connection with a project, and/or (ii) when a child over the minimum age specified in (iii) and under the age of 18 is employed or engaged in connection with a project in a manner that is likely to be hazardous or interfere with the child's education or be harmful to the child's health or physical, mental, spiritual, moral or social development.
- **Forced Labor:** An incident of forced labor occurs when any work or service not voluntarily **performed** is exacted from an individual under threat of force or penalty in connection with a project, including any kind of involuntary or compulsory labor, such as indentured labor, bonded labor, or similar labor-contracting arrangements. This also includes incidents when trafficked persons are employed in connection with a project.
- **Environmental pollution incident:** Exceedances of emission standards to land, water, or air (e.g., from chemicals/toxins) that have persisted for more than 24hrs or have resulted in harm to the environment.
- **Discrimination based on SOGI:** Discrimination means creating a distinction, exclusion, or restriction which has the purpose or effect of impairing or excluding a person based on their real or perceived sexual orientation, gender identity, gender expression, or sex characteristics from being on an equal basis with others.
- **Sexual Exploitation:** Any actual or attempted abuse of position of vulnerability, differential power, or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially, or politically from the sexual exploitation of another. In Bank financed operations/projects, sexual exploitation occurs when access to or benefit from a Bank financed Goods, Works, Non-consulting Services or Consulting Services is used to extract sexual gain.
- **Sexual Abuse:** Actual or threatened physical intrusion of a sexual nature, whether by force or under **unequal** or coercive conditions. In Bank financed operations/projects, sexual abuse occurs when a project related worker (contractor staff, subcontractor staff, supervising engineer) uses force or unequal power vis a vis a community member or colleague to perpetrate or threat to perpetrate an unwanted sexual act.
- **Sexual Harassment:** Any unwelcome sexual advance, request for sexual favor, verbal or physical conduct or gesture of a sexual nature, or any other behavior of a sexual nature that might reasonably

be expected or be perceived to cause offence or humiliation to another, when such conduct interferes with work, is made a condition of employment, or creates an intimidating, hostile or offensive work environment. In Bank financed operations/projects, sexual harassment occurs within the context of a subcontractor or contractor and relates to employees of the company experiencing unwelcome sexual advances or requests for sexual favor or acts of a sexual nature that are offensive and humiliating among the same company's employees.

- **Other**: Any other incident or accident that may have a significant adverse effect on the environment, the affected communities, the public, or the workers, irrespective of whether harm had occurred on that occasion. Any repeated non-compliance or recurrent minor incidents which suggest systematic failures that PMU deems needing the attention of the WB.

1.2 For environmental and social incidents

1.2.1 Form to be completed by PMU within 48 hours

Q1: Incident Details	
1. Date of Incident:	
2. Time:	
3. Date Reported to PMU:	
4. Date Reported to WB:	
5. Reported to PMU by:	
6. Reported to WB by:	
7. Notification Type (Email/'phone call/media notice/other):	
8. Full Name of Main Contractor:	
9. Full Name of Subcontractor:	
Q2: **Type of incident (please check all that apply)**	
1. ☐ Fatality 2. ☐ Lost Time Injury 3. ☐ Displacement Without Due Process 4. ☐ Child Labor 5. ☐ Acts of Violence/Protest 6. ☐ Disease Outbreaks 7. ☐ Forced Labor 8. ☐ Unexpected impacts on heritage resources 9. ☐ Unexpected impactson biodiversity resources 10. ☐ Environmental pollution incident 11. ☐ Dam failure 12. ☐ Other	
Q3: Description/Narrative of Incident	
For example: 1. What is the incident? 2. What were the conditions or circumstances under which the incident occurred (if known)? 3. Are the basic facts of the incident clear and uncontested, or are there conflicting versions? What are those versions? 4. Is the incident still ongoing or is it contained?	

5. Have any relevant authorities been informed?

Q4: Actions taken to contain the incident

Short Description of Action	Responsible Party	Expected Date	Status

For incidents involving a contractor:

1. Have the works been suspended under Contract GCC8.9?
   a) ☐ Yes
   b) ☐ No
2. Name of Contractor: **……**

Q5: What support has been provided to affected people?

1.2.2 Form to be completed by PMU (following investigation)

Q6. Fatality/Lost time Injury information

Cause of fatality/injury for worker or member of the public (please check all that apply):

1. ☐ Caught in or between objects
2. ☐ Struck by falling objects
3. ☐ Stepping on, striking against, or struck by objects
4. ☐ Drowning
5. ☐ Chemical, biochemical, material exposure
6. ☐ Falls, trips, slips
7. ☐ Fire & explosion
8. ☐ Electrocution
9. ☐ Homicide
10. ☐ Medical Issue
11. ☐ Suicide
12. ☐ Others

Vehicle Traffic:

13. ☐ Project Vehicle Work Travel
14. ☐ Non-project Vehicle Work Travel
15. ☐ Project Vehicle Commuting
16. ☐ Non-project Vehicle Commuting
17. ☐ Vehicle Traffic Accident (Members of Public Only)

Name	Age/DOB	Date of Death/injury	Gender	Nationality	Cause of Fatality/Injury	Worker (Employer)/Public

Q7: Financial Support/Compensation Types (To be fully described in Corrective Action Plan template)

1. ☐ Contractor Direct
2. ☐ Contractor Insurance
3. ☐ Workman's Compensation/National Insurance
4. ☐ Court Determined Judicial Process
5. ☐ Others
6. ☐ No Compensation Required

Name	Compensation Type	Amount (US$)	Responsible Party

Q8: Supplementary Narrative:

1.3 For SEA/SH Incident

1.3.1 Incident Form for SEA/SH (to be completed by PMU within 48 hours)

Q9. Incident Details		
Date of incident intake by project/GM:	Date Reported to PMU:	Date Reported to WBG:
Reported to project/GM by: 1. Survivor 2. Third party 3. Others:	Reported to PMU by: 1. GM operator 2. Directly, by Survivor 3. Directly, by third party 4. Others:	Reported to WBG by: 1. PMU 2. Directly, by Survivor 3. Directly, by third party 4. Other:
Q10. Is a record of this incident in GM? a) ☐ Yes b) ☐ No		
Q11: Incident type (please check all that apply) See Appendix 1 for definitions		
c) Sexual exploitation d) Sexual abuse e) Sexual harassment		
Q12: Provide the following details from the GM record.		
1. Age of survivor (if recorded in GM):		
2. Have the national legislation or mandatory reporting requirements been followed? f) ☐ Yes g) ☐ No		
3. Sex of survivor (if recorded in GM): a) ☐ Male b) ☐ Female c) ☐ Others		
4. Was the survivor referred to service provision? a) ☐ Yes b) ☐ No		
5. Is the survivor employed by the project (as indicated by the survivor or complainant and reported in the GM)? a) ☐ Yes		

	b) ☐ No
6.	Is the alleged perpetrator employed by the project (as indicated by the survivor or complainant and reported in the GM)? a) ☐ Yes b) ☐ No
Q13: Basis for further action	
1.	Has the complainant provided informed consent to lodge a formal complaint? a) ☐Yes b) ☐ No
2.	Does the employer have a suitable administrative process and capacity in place to investigate misconduct relating to SEA/SH in a survivor-centered way? a) ☐ Yes b) ☐ No
3.	Has the survivor provided informed consent to be part of an investigation into misconduct? a) ☐ Yes b) ☐ No
4.	Has the complaint been filed anonymously or through a third party? a) ☐ Yes b) ☐ No
5.	If the answer to any of these questions is no, has the GM assessed the risks and benefits of carrying out an investigation into the alleged misconduct, taking into account the survivor's safety and wellbeing? a) ☐ Yes b) ☐ No
6.	Will an investigation into misconduct be undertaken in addition to an investigation into adequacy of project systems, processes or procedures? a) ☐ Yes b) ☐ No

1.4 Incident Form for SEA/SH (to be completed by PMU following SEA/SH investigation)

Q14: Findings of the investigation	
1.	Have sanctions against a perpetrator been recommended as part of an investigation into misconduct? a) ☐ Yes b) ☐ No
2.	Has an investigation into adequacy of project systems, processes or procedures been undertaken? a) ☐ Yes b) ☐ No

Q15: Corrective actions to be implemented (To be fully described in Corrective Action Plan)		
Short Description of Action (SEA/SH examples)	**Responsible Party**	**Timeline for completion/Status**

1.	Referral of Survivor to holistic care services		
2.	Undertake disciplinary investigation in accordance with GM timelines and confirmed process		
3.	Disciplinary actions, including sanctions, to be applied following misconduct investigation by employer		
4.	Increased training on Codes of Conduct (CoC)		
5.	Audit of implementation of SEA/SH safety mitigation		
6.	Strengthened awareness training on project-related risks, CoC and how to report incidents for project-affected community		
7.	Training for project supervisors on the need to follow guidelines of behavior in CoC and their supervisory responsibilities		
8.	Plan to improve coverage/quality of service provision		
9.	Any other system strengthening measures or corrections for system failures that are necessary		

3.1 Project's Grievance Logbook

3.1.1 Sample for Local Levels

No	Name of complainant (or anonymous)	Addresses	Sex	Age	Contact information	Date Received	Details of nature of grievance (Environmental impacts, social impacts, labor, health, etc.)	Which of the three GRM that was used?	Actions taken to resolve grievance, by whom	How many steps that have been used in the relevant GRM	Date grievance was finally resolved/closed?	Notes

3.1.2 Sample for PMU Level to be elaborated on Excel spreadsheet with filter function

No	Questions	Response
1	**Date Received:**	
2	**Name of Complaint** (or anonymous):	
3	**Sex:**	
4	**Age:**	
5	**Contact information** (Phone number/email, other channel(s):	
6	**Location of Complainants** (Province, District, commune, village):	
7	**Form of grievance received** (Writing or Verbal (face to face, telephone, online), SMS, MOWRAM and DoWRAM comment box in designated Website/Face book/What's App, etc.	

8	**Channel of Receipt** (Direct to PMU GRM Focal Point, or Relayed from other channels (Provide details)	
9	**Key topics of Grievances** a) Labor and Working Condition Resettlement (incl Voluntary Land Donation) b) SEA/SH c) Environmental impacts d) Community Health and Safety Accidents	
10	**Nature of complaints?** a) Resolution required b) Clarification required c) Suggestion n only (for project improvement) d) General Concerns	
11	**Step 1 of GRM Procedure:**	
	a) Date receipted:	
	b) Date solved/transferred:	
	c) Duration spent (in days):	
12	**Step 2,3,4** (Replicated in Excel spreadsheet):	
13	**Closing of Case** (At which Steps, date of case closing):	
14	**Notes:**	

Annex 4 – Worker's Code of Conducts

The Annex has two Code of Conduct (COC): one is for ESHS and SEA/SH/VAC, and the other is for working with local Ethnic Communities.

1.1 Code of Conduct related to ESHS and SEA/SH/VAC

Instructions:

This Code of Conduct shall be perused and signed by all individual workers who enter direct work contract with a) PMU, b) PMU's consulting firms and service providers, c) contractors who renovate existing HCFs.

I,_____, acknowledge that adhering to environmental, social, health and safety (ESHS) standards, following the project's occupational health and safety (OHS) requirements, and prevention of Sexual Exploitation & Abuse (SEA)/Sexual Harassment (SH), are important.

I understand that that failure to follow ESHS and OHS requirement, or to partake in activities constituting SEA/ SH -- be it at the project site, the surrounding area of the project site, workers' camps, or the project communities, including community members and project workers, constitute acts of gross misconduct and are therefore grounds for sanctions, penalties, or potential termination of employment. Prosecution by the Police of those who commit SEA/SH may be proceeded as applicable under relevant Laws.

I agree that while working on the project, I will:

- Carry out my duties competently and diligently.
- Comply with this Worker's Code of Conduct and all applicable laws, regulations, and other requirements, including requirements to protect the health, safety and well-being of other project workers, and any other person and community members.
- Maintain a safe working environment including by:
    - Ensure that workplaces, machinery, equipment, and processes under each person's control are safe and without minimal risk to health and safety of those involved.
    - Use appropriate measures relating to chemical, physical and biological substances, and agents; and
    - Follow applicable emergency response procedures.
- Report works situations that I believe unsafe or unhealthy to either project workers and/or community and remove myself and inform those relevant to remove themselves from a work situation which I reasonably believe imminent and dangerous to safety, life, and

health of those involved.

- Consent, if required, to a background check in any place I have worked for more than six months.
- Attend and actively partake in training courses related to ESHS, OHS, SEA/SH and VAC, as requested by my employer.
- Always wear my personal protective equipment (PPE), as required while at work or engaged in project related activities.
- Take all practical steps to implement the environmental and social management plan (ESMP), which may include OHS Management Plan.
- Abide by a zero-tolerance policy as to SEA/SH/VAC and alcohol consumption during work activities, and refrain from use of narcotics or other substances which can impair worker's expected working ability and judgement.
- Respect women, children (persons under 18 years of age), and the elderlies regardless of their ethnic background, language, religion, personal opinions, disability, and/or other socioeconomic status.
- Shall not use language or behavior that are inappropriate to community members and project workers, particularly women, children, and the elderlies,
- Shall not commit any sexual abuse and or exploit, and/or sexual harassment of any kinds to community members in the project area and any project workers.
- Shall not engage in sexual harassment of project personnel and staff — for instance, making unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature (looking somebody up and down; kissing, howling or smacking sounds; hanging around somebody; whistling and catcalls; in some instances, giving personal gifts.
- Shall not engage in offering any work-related favors such as making promises of favorable treatment (i.e., promotion), or make threats of unfavorable treatment (i.e., loss of job), or make payments in kind or in cash depending on sexual acts — or other forms of humiliating, degrading or exploitative behavior.
- Shall not engage in using prostitution service -- in any form and at any time during project implementation.
- Shall not participate in sexual contact or activity with children under 18 years of age — including grooming or contact through digital media. Mistaken belief regarding the age of a child is not a defense. Consent from the child is also not considered a defense or excuse.
- Consider reporting through the project's GRM, or to my manager, any suspected or actual SEA/SH deed by a fellow worker, whether employed by my company or not, or any breaches of this Code of Conduct.
- Complete relevant training courses that will be provided related to the environmental and

social aspects of the Contract, including on health and safety matters, and Sexual Exploitation & Abuse, Sexual Harassment, and Violence Against Children (VAC).

- Report violations of this Code of Conduct; and

With respect to children under the age of 18:

- Bring to the attention of my manager the presence of any children on the construction site or engaged in hazardous activities.
- Wherever possible, ensure that another adult is present when working in proximity to children.
- Shall not invite unaccompanied children unrelated to my family into my home unless they are at immediate risk of injury or in physical danger.
- Not use any computers, mobile phones, video, and digital cameras or any other medium to exploit or harass children or to access child pornography (see also “Use of children's images for work related purposes” below).
- Avoid, in all circumstances, any verbale and/or physical punishment or discipline of children.
- No hiring of children (under 18) in any project activity.
- Comply with all relevant local regulations, including labor law in relation to child labor and forced labor.
- Take appropriate caution when photographing or filming children (see also section below). Photos or films of children should not be taken under the project, except for instances showing the benefits or impacts of road works, such as impacts to schools or school safety trainings.

Use of children's images for work related purposes

When photographing or filming a child for work related purposes, I must:

- Before photographing or filming a child, assess and endeavor to comply with local traditions or restrictions for reproducing personal images.
- Before photographing or filming a child, obtain informed consent from the child and a parent or guardian of the child. As part of this, I must explain how the photograph or film will be used.
- Ensure photographs, films, videos present children in a dignified and respectful manner and not in a manner that is vulnerable or submissive. Children should be adequately dressed up and not in poses that could be seen as sexually suggestive.
- Ensure images are honest representations of the context and the facts.
- Ensure file labels do not reveal identifying information about a child when sending images electronically.

Raising Concerns

If any person observes behavior that I believe may represent a violation of this Code of Conduct, or that otherwise concerns me, I will raise the issue promptly. This can be done in either of the following ways:

1. Contact [enter name of the Employer's Social Focal Point] to handle these incidences.
2. Call Employer's telephone number (See contact detail at Section 5 of project's Stakeholder Engagement Plan).

The person's identity will be kept confidential, unless reporting of allegations is mandated by the country law. Anonymous complaints or allegations may also be submitted and will be given all due and appropriate consideration. PMU will take all reports of possible misconduct seriously and will investigate and take appropriate action. In case of SEA/SH, PMU will provide referral to local service provider who will provide support to SEA/SH victims (See also Section 6.4 of project's Stakeholder Engagement Plan).

There will be no retaliation against any person who raises a concern in good faith about any behavior prohibited by this Code of Conduct. Such retaliation would be a violation of this Code of Conduct.

Sanctions

I understand that if I breach this Workers' Code of Conduct, my employer will take disciplinary action which could include:

- Informal warning.
- Formal warning.
- Additional Training.
- Termination of employment.
- Report to the Police if warranted.

I understand that it is my responsibility to:

Ensure that the Environmental, Social, Health and Safety requirements are met. Adhere to the Occupational Health and Safety Management Plan

Avoid actions or behaviors that could be construed as SEA/SH/VAC. Any such action will be a breach of this Workers' Code of Conduct.

I hereby acknowledge that I have perused the foregoing part of this Workers' Code of Conduct, agree to comply fully with the requirements contained therein and understand my roles and responsibilities to prevent and respond to ESHS, OHS, SEA/SH/VAC issues. I understand that any actions that are inconsistent with this Workers' Code of Conduct, or failure to act as mandated by this Workers' Code of Conduct may result in disciplinary action and may affect my ongoing employment.

Signature: _____

Printed Name: _____

Title: _____

Date: _____

1.2 Code of Conduct for Working with Local Ethnic Communities

This Code of Conduct is grounded on the objectives of the WB's ESS7, which are:

- To ensure that the development process fosters full respect for the human rights, dignity, aspirations, identity, culture, and natural resource-based livelihoods of Indigenous Peoples.
- To avoid adverse impacts of projects on Indigenous Peoples, or when avoidance is not possible, to minimize, mitigate and/or compensate for such impacts.
- To promote sustainable development benefits and opportunities for Indigenous Peoples in a manner that is accessible, culturally appropriate and inclusive.
- To improve project design and promote local support by establishing and maintaining an ongoing relationship based on meaningful consultation with the Indigenous
- To recognize, respect and preserve the culture, knowledge, and practices of Indigenous Peoples, and to provide them with an opportunity to adapt to changing conditions in a manner and in a timeframe acceptable to them.

Annex 5 – Simplified Pest Management Plan

1.1 Rationale

In Cambodia, around 90% of cultivated land is used for rice production. Rice alone accounts for about 70% of the country's total calorie supply. Rice production contributes an estimated 44% of rural household income, making the rice sector an area for strategic development in the country. Despite rice is the major crop in Cambodia, rice production is characterized by widespread misuse of pesticides. This is due to inconsistent enforcement of current regulation and a lack of information on pesticide safety and alternative pest management techniques among rice farmers. Most pesticides are imported and labelled in a foreign language incomprehensible to farmers. It is common that rice farmers mix two to five pesticides by intuition, leading to pesticide poisoning among farmers and adverse impact on environment[4]. Rice farmers tend to apply more pesticide when they see pests on their field[5]. Vegetable farmers also typically mix various types of pesticides per spray which is not good practice[6].

The CWSIP project will 1) improve overall water security for all stakeholders in the targeted basins in three provinces, 2) exploit the potential of the unused water resources and increase agricultural productivity in the targeted basin, and 3) enhance the overall capacity of the water resources management of the central government, concerned local governments, and concerned communities. Through three out of five project components, the project will improve 1) Water Service Delivery, 2) Agricultural Productivity, and 2) Water Resources Management. The project does not involve procurement of pesticides.

Under CWSIP, the project will support target farming population in irrigated area to improve their use of good agricultural practices, including integrated crop water management, climate-smart agriculture (diversification into high-value crop plantation, public-private-partnership and commercialization), as well as agribusiness and trade development. The CWSIP does not involve procurement of chemical fertilizers, pesticides, and/or other toxic agrochemicals nor promote use of chemical agricultural inputs during project implementation. However, rehabilitation /upgrading of existing reservoirs/irrigation system, etc. to be financed under the Project are expected to increase the agricultural command areas, including the number of crops per year. This increased crop may give rise to increased use of fertilizers, pesticides, and/or other toxic agrochemicals in the subproject areas which are unintended impact of the project.

1.2 Key Pesticide Management Outcomes in Cambodia

[4] https://ipmil.cired.vt.edu/our-work/projects/rice-ipm-for-cambodia/

[5] Matsukawa, M., Ito, K., Kawakita, K. et al. Current status of pesticide use among rice farmers in Cambodia. Appl Entomic Zool51, 571–579 (2016). https://doi.org/10.1007/s13355-016-0432-5.

[6] Sim Skooching, Keo Socheat and Sarom Moldiest. 2021. Pesticide Use Practices in Cambodia's Vegetable Farming. CDRI Working Paper Series No. 128. Phnom Penh: CDRI.

Pesticide Use and IPM implementation in Project Provinces: General Directorate of Agriculture (GDA)'s survey in 2014 and nation-wide inspections in 2013 of pesticide and herbicide suppliers in provincial capitals and other main distribution hubs, indicate that the most commonly sold products include: abamectin, chlorpyrifos, cypermethrin, glyphosate, imidacloprid. In the Northern provinces, where a large part of the herbicide use is on corn and rubber plantations, the main products sold are the herbicides Glyphosate, Paraquat and Atrazine. Nowadays, on Rice and Maize cultivation farmers don't use pesticide accept some vegetables. These inspections have also shown that the most problematic highly hazardous products, such as monocrotophos, methyl parathion, methamidophos, mevinphos, endosulfan, etc., are no longer found on the market with the exception of the occasional old bottle. The only banned products that still are found regularly are paraquat and methomyl. This is because these products were banned only recently (2010) and are still permitted in the neighboring countries from where they are informally brought in by users or retailers. The banning of highly hazardous pesticides in China does not seem to have led to dumping of old stocks in Cambodia. There are no known large stocks of obsolete pesticides.

Insecticides are used mainly on vegetables (such as Long Yard Bean, Chilly, Cabbage, Chinese Cabbage) marketable high-value crops and plantation crops, notably rubber. Field surveys by the national IPM program and GDA indicate there still is wide-spread abuse of pesticides among farmers. Lack of knowledge among farmers is a major constraint. Abuse includes mixing without justification (just to be sure), use of wrong pesticides, use of wrong dosages, etc. Adequate protective gear is hardly being used. Shops often have gloves and masks for sale, but these tend to be inadequate for protection against hazardous chemicals. Buyers of pesticides rarely also buy protective gear, and shops do not provide it for free. Half used pesticide bottles or packages are often stored within the house or near homesteads, often in easy reach of children. Empty pesticide containers are often discarded at the border of fields or in drainage ditches.

1.3 Government Regulation Related to Pest Management

Pest management practices in Cambodia have been promoted through the expansion of the National Integrated Pest Management (IPM) Program by both the government and NGOs. These agencies have been working together to establish a Pesticide Reduction Network to develop awareness of the risks associated with pesticide use amongst farmers.

As a key function, Ministry of Agricultural and Forestry (MAFF) has been examining and implementing various international legal guidelines and instruments relating to regulating the trade, distribution and use of pesticides in Cambodia. These include adherence to the FAO Code of Conduct on the Distribution and Use of Pesticides, the Stockholm Convention on Persistent Organic Pollutants, and the WTO sanitary and phytosanitary measures.

Following the promulgation of the Law on Management of Pesticides and Fertilizers as Royal Kram Number 0112/005 on 14th January 2012, MAFF had developed five Prakas in relation to Procedures for Registration and Business Operations, as follows:

- Prakas No. 415/MAFF dated 17 August 2012, on Procedures and Standard

Requirements for Fertilizer Registrations.

- Prakas No. 456/MAFF dated 19 October 2012, on Procedures and Standard Requirements for Pesticide Registrations.
- Prakas N. 484/MAFF dated 26 November 2012, on List of Pesticides in the Kingdom of Cambodia.
- Prakas No. 119/MAFF dated 11 April 2013, on Procedures for Management of Fertilizers for Business Operations.
- Prakas No. 120/MAFF dated 11 April 2013, on Procedures for Management of Pesticides for Business Operations.

Within MAFF, the Department of Agriculture Legislation and GDA are mandated to oversee all pesticide regulations and use.

1.4 International Code of Conduct on the Distribution and Use of Pesticides

The following rules are observed for IPM:

- The standards of conduct set forth in this Code: 1.7.6. are designed to promote Integrated Pest Management (IPM) (including integrated vector management for public health pests).
- Concerted efforts should be made by governments to develop and promote the use of IPM. Furthermore, lending institutions, donor agencies and governments should support the development of national IPM policies and improved IPM concepts and practices. These should be based on scientific and other strategies that promote increased participation of farmers (including women's groups), extension agents and on-farm researchers.
- All stakeholders, including farmers and farmer associations, IPM researchers, extension agents, crop consultants, food industry, manufacturers of biological and chemical pesticides and application equipment, environmentalists and representatives of consumer groups should play a proactive role in the development and promotion of IPM.
- Governments, with the support of relevant international and regional organizations, should encourage and promote research on, and the development of, alternatives posing fewer risks: biological control agents and techniques, non- chemical pesticides and pesticides that are, as far as possible or desirable, target-specific, that degrade into innocuous constituent parts or metabolites after use and are of low risk to humans and the environment.
- Governments should provide extension and advisory services and farmers' organizations with adequate information about practical IPM strategies and methods, as well as the range of pesticide products available for use.

- Governments should ensure that any pesticide subsidies or donations do not lead to excessive or unjustified use which may divert interest from more sustainable alternative measures.

1.5 Current Governmental Implementation Arrangements Related to Pest Management

Integrated Pest Management (IPM) refers to all pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimize risks to human health and the environment. IPM emphasizes the growth of a healthy crop with the least possible disruption to agro-ecosystems and encourages natural pest control mechanisms.

Under MAFF, Plant Protection Centers and their branches in provinces as well as Agricultural Extension Centers at district level are governmental agencies that coordinate and work on Integrated Pest Management Programs. These activities are built on the National IPM program that was initiated with assistance from the FAO, DANIDA and other donors since early 1990s which is largely being maintained using national budget.

IPM activities implemented by these local authorities and technical backstopping by experts from GDA include conducting field surveys, making forecast, monitoring and checking progress of on-field pest development. Using the forecast based on the timing, scale and level of damage that the key pests may cause, provincial plant protection authorities recommend policies, plans, and measures for pest management purposes.

Relevant authorities such as Plant Protection Centers and Agricultural Extension Centers also conduct IPM training for farmers. Farmers learn how to implement various integrated measures such as pest identification, pest control, pest analysis, pest surveillance, and apply measure to control pest, such as applying chemical and botanical control agent, promoting application of biological measures for pest management, reducing chemicals and practice sustainable IPM. Farmers are also trained on proper use of chemical pesticide and fertilizers to ensure efficiency in pest management, ensuring safety for human, natural enemy, and the environment. Communication campaigns on plant protections and quarantine legislations and advance IPM technics to the farmers are also carried out depending on budget availability, etc.

GDA's Plant Protection Center, including the national IPM program, has developed a 3-day curriculum for a Farmer Training on Pesticide Risk Reduction (FT-PRR) which is intended to raise awareness, develop capacity and help rural communities formulate and implement their own action plans for pesticide risk reduction. As of June 2014, some 4,900 Lao farmers (including 1,600 women) have participated in FT-PRR courses in 149 villages of 34 Districts in 9 provinces. Season-long Integrated Pest Management training through Farmers Field Schools (FFS) often includes these short-duration FT-PRR courses. These FFSs allow farmers to learn about and adopt Integrated Pest Management to reduce overuse of pesticides in crop production. 10. The

National IPM Program has implemented 806 season-long IPM Farmers Field Schools, with over 24,350 rice, vegetable and fruit farmers trained. More, however, remains to be done. Pesticide Risk Reduction and IPM adoption at farm level remains a priority for the Government.

Operational costs of plant protection agencies are allocated from state funds. Their staff also work on projects and programs that are financed by other international funding and conduct additional annual trainings (using international budget) for farmers.

1.6 Objective of Simplified Pest Management Plan

This Simplified Pest Management Plan (S-PMP) aim to see out plan and measures to ensure the project does not unintentionally give rise to increased overuse of chemical agricultural inputs (such as chemical pesticide, fertilizers, and plant growth regulators, etc.). This S-PMP will be integrated into on-going pest management program and effort that provincial DAFF in project provinces have been doing and make sure pest management efforts target areas where water access is improved through project investment activities.

To mitigate this potential impacts as a 'good practice', the subproject owner will prepare and implement a S-PMP aiming to increase famers knowledge on Government regulations, policies, and/or technical guidelines related to safe use (application, storage, and disposal) of pesticides and toxic agrochemicals likely to be used by farmers as well as promote the application of an Integrated Pest Management (IPM) practice that are appropriate for the agriculture productions in the subproject area through training and other capacity building activities.

Key Elements - The elements of the S-PMP include the followings:

- Preventing pest problems.
- Monitoring for the presence of pests and pest damage.
- Establishing the density of pest population, which may be set at zero, that can be tolerated or corrected with a damage level sufficient to warrant treatment of the problem based on health, public safety, economic or aesthetic threshold.
- Treating pest problems to reduce population below those levels established by damage thresholds using strategies that may include biological, cultural, mechanical and pesticidal control methods and that shall consider human health, ecological impact, feasibility and cost effectiveness; and
- Evaluating the effects and efficacy of pest treatments.

Decision Making

Detecting a single pest under the Project will not always mean control is needed. A decision to use pesticides will be taken only as the very last resort and will also be based on conclusions reached from an agroecosystem analysis and trials. The decision will also depend on the number of pests and diseases found in the respective crop and the level of damage they are doing. If it is

necessary to spray crops with pesticides, use of selective rather than broad-spectrum pesticides shall be strictly observed.

Pest Monitoring and Surveillance

A process for the reporting and identification of unusual plants, animals and pests will be established to

track and document all pest cases, be it minor or major in a pest inventory register. Pest surveys will be conducted on a regular basis to detect new infestations and will include the types, abundance, location of pest plants, date when first spotted or seen, and date when reported. This information will be

gathered from surveillance or monitoring system to be put in place, periodic surveys to be conducted and feedback from farmers/farm assistants. The data will be managed in a standardized way so that trends can be established. A rapid response process for the management of new infestations will be established to treat and manage new pest infestations as soon as they are identified.

Table 1. Potential impacts and proposed mitigation for pest

Potential Impacts	Proposed Mitigation
Contamination of ground water resources	Conducting trials on relatively flat land with less than 2% slope reducing the possibility of run off and at more than 500m away from water sources
Effect of pesticides on non-target species	Use pesticides that are systemic and narrow range and specific to sucking insects.
Effect of pesticides on grazing areas, settlements	Spraying in the morning hours when the weather is cool and less windy to reduce spray drifts. Locating trials or plots at distance of between 500-1000m away grazing areas or human settlements
Possibility of increasing resistance of pests to the pesticide	Training of field staff responsible on recommended usage of the pesticide
Harmful effects on staff applying pesticides	Provision and usage of safety clothing and working gear to staff
Harm to people within the homestead where the chemical is stored	Designation of a separate and secured storage room for pesticide Warnings and notices to increase awareness

1.7 Mitigation Measures

It is expected that there will be no procurement of pesticides under the project and that pesticide use, overall, will decline as a result with the introduction of good agricultural practices. To ensure the tendency of increased overuse of pesticide does not happen with subproject where project intervention take place, the project will prohibit procurement of large pesticides using the “negative list” and provide training to key staff and farmers on integrated pest management, safe use of pesticides, and organic farming practices. This will be integrated as part of the safeguard training. This S-PMP will be applied to the project activities that involve:

a) Any rehabilitation/upgrading of weirs/reservoirs/dams/existing irrigation schemes that are likely to prompt farmers to increase their use of pesticides:

b) Change/introduction of best agricultural practices such as integrated crop water management, Climate-smart agriculture, and

c) Promotion of agribusiness and trade related to farm products produced from target command area, and neighboring areas.

The plan is comprised of three parts:

(i) Application of government regulation on pesticide control.

(ii) Training of the integrated pesticides concept and/or other approaches for the safe use of pesticides; and

(iii) Monitoring.