

Support to Mainstreaming Climate Change Adaptation into Sectorial Planning in Lao PDR – GCF Readiness Support Project



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Support to Mainstreaming Climate Change
Adaptation into Sectorial Planning in Lao PDR –
GCF Readiness Support Project

Situation Analysis Report (Final)

June 2025

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Acronyms and Abbreviations

CECCAP	Implementation Centric Evolving Climate Change Adaptation Process
CRVA	Climate Risk and Impact Assessment
DCC	Department of Climate Change
DWR	Department of Water Resources
EbA	Ecosystem-based adaptation
GCF	Green Climate Fund
GEF	Global Environment Facility
GESI	Gender Equality and Social Inclusion
GHG	Greenhouse Gas
GGGI	Global Green Growth Institute
IPCC	Intergovernmental Panel on Climate Change
M&E	Monitoring and Evaluation
MoNRE	Ministry of Natural Resources and Environment
NAP	National Adaptation Plan
NAPA	National Adaptation Programme of Action
NBS	nature-based solutions
NDC	Nationally Determined Contribution
NGO	Non-Government Organisations
NSEDP	National Socio-Economic Development Plan
SAPs	Sectoral Adaptation Plans
ToR	Terms of references
UNFCCC	United Nations Framework Convention on Climate Change

1 Introduction

1.1 Background to the Project

Lao PDR is highly vulnerable to climate change, particularly floods and droughts and completed its second Nationally Determined Contribution (NDC) in 2020 and is finalizing the National Adaptation Plan (NAP) in 2024, which updates the 2009 National Adaptation Programme of Action (NAPA). As a signatory to the UNFCCC and Paris Agreement, the country is committed to addressing climate change through technical and financial support for adaptation planning. The 2020 NDC highlights challenges in measuring adaptation progress, especially due to a lack of sector-specific adaptation plans and indicators, particularly in agriculture, forestry, urban development, and water resources.

In November 2022, the Green Climate Fund (GCF) approved a project to help mainstream climate adaptation into sectoral planning in Lao PDR, focusing on agriculture, forestry, transport, urban development, and water resources. This project, led by the Department of Climate Change (DCC) with technical assistance from GGGI, aims to enhance climate resilience and develop concept notes for adaptation projects to access GCF funding. It will run for 18 months, ending in November 2025.

Two similar projects are also underway: the UN Habitat's NAP, funded by GCF, and UNEP's NAPs, funded by the Global Environment Facility (GEF). The UNEP project focuses on creating the first national NAP, while the UN Habitat project targets local-level climate vulnerability assessments for disaster risk management in settlements. Both projects aim to support and align with Lao PDR's NAP process.

1.2 Objectives of the project

The goal of this project is to strengthen climate resilience in Lao PDR by incorporating climate change adaptation into the strategic planning of three vulnerable sectors: agriculture and forestry, urban development and transport, and water resources. This will be achieved by conducting a climate risk and vulnerability assessment at the national level. Sectoral adaptation plans will be developed, along with recommendations for integrating them into the sectors' five-year development plans (2025-2030) and relevant strategies to improve their climate resilience. This project will undergo regular validations and exchanges with key stakeholders through various workshops.

The present assignment is mainly related to outcome 3.2 of the above-mentioned GCF Readiness Project Proposal, such outcome can be summarized as follows:

Outcome 3.2: Evidence basis produced to design adaptation solutions for maximum impact.

Output 3.2.1: Agriculture & Forestry, Urban Development, and Water Sectoral Adaptation Action Plans Develop and Disseminated.

- ▶ Activity 3.2.1.1: Review and analysis of available climate information including past and planned studies and assessments to identify the gaps and needs
- ▶ Activity 3.2.1.2: Conduct Climate Change Vulnerability and Risk Assessment
- ▶ Activity 3.2.1.3: Develop a guideline for sectoral planning
- ▶ Activity 3.2.1.4: Organize workshop with sectoral adaptation teams to formulate adaptation action plans
- ▶ Activity 3.2.1.5: Formulate sectoral adaptation action plans

- ▶ Activity 3.2.1.6: Provide recommendations for the effective integration of priority sectoral adaptation actions
- ▶ Activity 3.2.1.7: Organize workshop to communicate sectoral adaptation action plans
- ▶ Activity 3.2.1.8: Consolidate sectoral monitoring and reporting systems developed under 3.2.1.

1.3 Objectives of the Situation Analysis

This Situation Analysis Report is developed as part of The Project "Support for Mainstreaming Climate Change Adaptation into Sectoral Planning in Lao PDR" by mainstreaming climate change adaptation into the strategic planning of three key vulnerable sectors: **Agriculture and Forestry, Urban Development and Transport, and Water Resources.**

Building on the findings from the Inception Phase, this report serves as a foundational step in assessing existing policies, identifying sectoral adaptation measures, and integrating the best regional and international practices to inform the next phases of the project.

The Situation Analysis Report specifically aims to:

- ▶ Present the Climate Risk and Vulnerability Assessment (CRVA) methodology along with an initial sectoral analysis. This will include a first insight into climate hazards and stressors. The report will also provide initial recommendations for addressing key climate hazards. The objective will be to complement the information provided in the inception report and to refine the methodology previously proposed, particularly in relation to the comments made by the client during the inception report. This report is an interim report, and it will not go into too much detail about the CRVA. The goal here is to begin structuring an intervention logic and to highlight information that will be further developed, cross references and put into perspective during the CRVA report.
- ▶ Establish a methodology for prioritizing adaptation actions, using clear criteria and decision-support tools, particularly through a Multi-Criteria Analysis (MCA). This will help ensure a structured and evidence-based approach to selecting effective adaptation measures.
- ▶ Conduct a stocktaking of international, national and regional guidelines, including a comprehensive review of existing frameworks. The analysis will explore how these global and regional guidelines can be integrated into Lao PDR's Sectoral Adaptation Plans (SAPs) while ensuring alignment with national policies. Additionally, the report will highlight policy gaps that require attention for improved coherence of the sectoral adaptation measure with international standards
- ▶ Review existing legislation and institutional frameworks related to climate change adaptation in Lao PDR. This includes analyzing current laws and regulations, identifying key gaps, and proposing necessary legislative reforms to strengthen adaptation governance—particularly at the sub-national level.

This deliverable initiates Phase 2: Climate Risk and Vulnerability Assessment (CRVA), establishing a critical foundation for the upcoming Deliverable3 (D3) CRVA. It also lays the groundwork for Phase 3: Sectoral Adaptation Recommendations, which will lead to the development of Deliverables 4.1 and 4.2—the Sectoral Adaptation Guidelines and Sectoral Adaptation Plans.

As an intermediate report, it aims to deepen the initial findings from the inception phase and prepare the ground for subsequent stages of analysis. It allows for a preliminary exploration of key knowledge areas and outlines early insights, particularly in relation to the recommendations

presented in Section 7 [Sectoral Adaptation Guidelines and SAP Development](#). These initial proposals will be further refined and substantiated through the results of the forthcoming CRVA and continued stakeholder engagement.

The findings presented here will inform and guide the technical assessments, consultation activities, and strategic decision-making processes that follow, ensuring a coherent and evidence-based progression throughout the project lifecycle.

2 Climate Risk and Vulnerability Assessment (CRVA) Methodology

2.1 Overview of CRVA Methodology

2.1.1. Data collection approach

The consultant is aware that the CRVA should not be developed in isolation but rather builds on previous analyses of climate risk and adaptation in the country.

Also, given the large amount of available data and the existence of provincial CRVAs carried out as part of the NAP-UNEP, the consultant will conduct the sectoral CRVA primarily based on the available data, analyses, and reports. The consultant thus favors a data review based on existing reports, in coherence with the existing data at the national and provincial levels where CRVAs have already been carried out.

The consultant will primarily use the “**Lao PDR Provincial Storyline-based Climate Risk, Vulnerability and Adaptation Assessment**” inputs to inform the sectoral climate assessment, which is itself informed by the 2020 Provincial Climate Change and Vulnerability Assessment (CCVA), the Sectoral risk and Adaptation analysis and the latest draft NAP version. This document is particularly solid and robust as the result of a deep literature review as 148 articles were selected and reviewed.

Regarding the Vulnerability Assessment, a complete literature review of the sectoral documents will be carried out. Some additional data could also be collected and obtained from the Laos Statistical Information Service and the Atlas of Agricultural Livelihoods and based on the Focus Group Discussions that will be led in the Month of May with the different ministries and department involved in the Project. In order to have a more detailed and clear overview of data sources and content, there is a literature of data sources in [Appendix 1](#). Following discussions with GGGI, the consultant has decided to adopt a risk and impact assessment approach primarily based on a qualitative approach through consultations with key stakeholders for each sector. To achieve this, sectoral focus group discussions will be organized, involving several ministries and departments. The goal is to present them the project and guide them through questions to make them share and gather feedback and expertise on climate change issues and adaptation strategies by sector. These discussions will aim to confirm or provide additional information about the sectors exposed to climate hazards, discuss sensitivity factors, adaptive capacities, and also assess the impacts. In [Appendix 2](#) is the data to detailing goals and organization of these Focus Group Discussions.

A risk assessment using a scoring system is proposed by the consultant for the sectoral CRVA. The scoring levels will be discussed with local stakeholders to reflect both their knowledge and concerns.

2.1.2. Scope of study

2.1.2.1 Geographical scope

The Climate Risk and Vulnerability Assessment (CRVA), along with the adaptation action plans, will be developed at the national scale for Lao PDR.

For the hazard analysis, the consultant will use the data from the report "Lao PDR Provincial Storyline-based Climate Risk, Vulnerability, and Adaptation Assessment", which primarily focuses on six provinces. The selection of these six provinces was made by the Project Management Unit (PMU) and the Department of Climate Change (DCC) in the framework of this previous assignment **to ensure a representation of the country's diverse geographies and livelihoods**. These provinces are as follows:

1. Phongsaly
2. Oudomxay
3. Xiengkhouang
4. Khammouane
5. Xekong
6. Champasack

While a focus on these 6 provinces will be adopted for the hazard analysis, a predominantly national approach will be adopted for the sectoral vulnerability analysis.

Figure 1: The six selected provinces for this assessment



Source : Lao PDR Provincial Storyline-Based Climate Risk, Vulnerability and Adaptation Assessment, October 2024

2.1.2.2 Sectors scope descriptions

Based on the NAP-UNEP documents¹ review, the sectors considered in the CRVA and the proposed Sectoral Action Plan are briefly described below:

► Agriculture and Forestry

Agriculture and forestry are the backbone of Laos' economy and the livelihood of a large portion of its rural population. The agriculture sector primarily revolves around the cultivation of rice, which is the staple food and a key export product, along with other crops such as cassava, maize, and vegetables. Livestock farming and fishing are also important contributors to the rural economy.

The forestry sector in Laos is rich in natural resources, with vast forest areas that provide timber, non-timber forest products, and contribute to the country's biodiversity. Forests also support sustainable livelihoods for many local communities through fuelwood collection and traditional practices. Moreover, forests are vital for carbon sequestration and protecting watersheds.

Key Features:

- Agriculture is central to Laos' economy, particularly in rural areas, where the majority of the population depends on it for sustenance and income.
- The country's forests are home to diverse species and ecosystems, and they support timber extraction, biodiversity conservation, and non-timber forest products.
- Rice cultivation is a staple of the agricultural sector, and the country also produces cash crops such as coffee, tea, and rubber.
- Agriculture is primarily rain-fed, and smallholder farming is common, which makes it vulnerable to changes in land use and natural resource management.

Challenges:

- The sector faces challenges in sustainable land management, soil fertility, and maintaining forest cover due to increasing demand for agricultural land.
- Deforestation and illegal logging threaten forest resources and biodiversity.

► Urban development and transport

The urban development and transport sectors in Laos are integral to the country's ongoing development as urbanization increases. Vientiane, the capital city, along with other growing cities like Savannakhet and Pakse, are experiencing rapid urbanization, which brings about both opportunities and challenges in terms of infrastructure, housing, and services.

The transport sector in Laos is less developed compared to many neighbouring countries, but the government has been focusing on improving road networks, rail links, and air transport infrastructure to support economic growth and facilitate connectivity.

¹ *National Adaptation Plan – Draft version - 2023 and Lao PDR Provincial Storyline-based Climate Risk, Vulnerability and Adaptation Assessment*

Key Features:

- Urban development is increasing in major cities as the rural population migrates to urban areas for employment opportunities. This trend results in expanding housing needs, infrastructure development, and municipal services like water supply, drainage, solid waste collection and landfilling, and sanitation.
- The government is working to enhance urban planning, focusing on sustainable city growth, public transport systems, and the improvement of urban infrastructure.
- The transport sector includes a network of roads, bridges, railways, and airports. While road infrastructure is the dominant mode of transport, Laos has also been expanding its rail network, with regional connectivity projects like the Kunming–Vientiane railway and better connectivity with the Thai rail network.

Challenges:

- With rapid urbanization, urban planning becomes crucial to prevent the unregulated expansion of informal settlements and ensure adequate access to basic services.
- The country faces significant gaps in public transportation systems and climate-resilient infrastructure, while traffic congestion and pollution are emerging as urban issues.
- Infrastructure development often outpaces regulatory frameworks, posing challenges in terms of sustainability, environmental impacts, and equitable development.
- Some urban areas struggle due to outdated and inadequate drainage systems leading to flash floods during heavy rainfall. Addressing urban drainage and flood management is essential for climate resilience and sustainable urban development.

► **Water resources**

The water resources sector in Laos is essential for the country's development, as water is a critical resource for agriculture, energy production, domestic consumption, and industry. Laos is endowed with abundant water resources due to its location within the Mekong River Basin, making it a critical player in regional water management.

The hydropower industry is one of the most significant components of Laos' energy sector, with the country aiming to become the “battery of Southeast Asia” through the development of hydroelectric power plants. Additionally, irrigation systems are essential to agriculture, particularly in rice-growing regions.

Key Features:

- The Mekong River and its tributaries provide a large share of the country's water resources, essential for both hydropower and agriculture. There are 14 discrete river basin sub-catchments in Laos.
- Laos is a key player in the regional hydropower sector, with numerous hydroelectric dams generating electricity for both domestic use and export.
- The country's irrigation systems support agricultural production, particularly in the lowland areas that rely heavily on water for rice cultivation.
- Water resources are managed through a combination of government agencies, water user associations, and private sector investments.

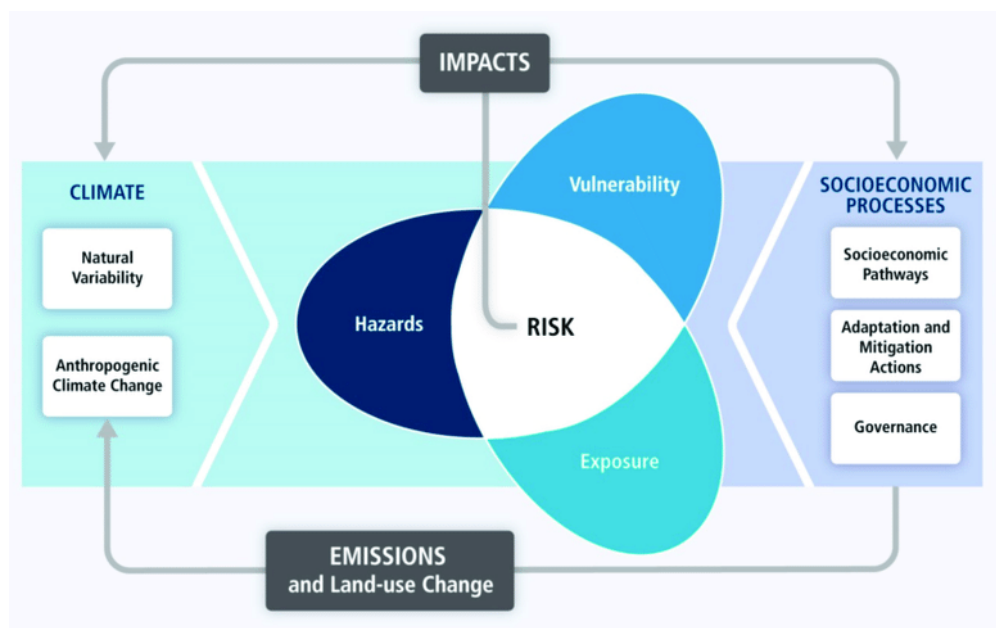
Challenges:

- Water quality issues, such as pollution from industrial activities, untreated domestic wastewater and agricultural runoff, affect both drinking water and ecosystem health.
- As Laos develops its hydropower potential, there are concerns about regional water management, particularly with neighbouring countries like China, Vietnam, Thailand, and Cambodia, over water sharing and the impacts of large dams.
- Water scarcity in certain regions, especially during dry spells, poses risks for agricultural production and domestic consumption, requiring better water management strategies.

2.1.3. Definitions: our approach of risk

Our definition of risk, and that in the NAP and the document “Lao PDR Provincial Storyline-based Climate Risk, Vulnerability and Adaptation Assessment” are based on the IPCC Fifth Assessment Report (AR5; <https://www.ipcc.ch/assessment-report/ar5/>)². Climate risk centres on the interaction between hazard, vulnerability and exposure. Also, the consultant will adopt the same definitions detailed above based on the IPCC report, AR5.

Figure 2: Definition of Risk (IPCC, AR5)



Hazard: The potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources. In this report, the term hazard usually refers to climate-related physical events or trends or their physical impacts.

Exposure: The presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected.

Vulnerability: The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt.

Impacts: Effects on natural and human systems. The term impacts is used primarily to refer to the effects on natural and human systems of extreme weather and climate events and of climate change. Impacts generally refer to effects on lives, livelihoods, health, ecosystems, economies,

² The consultant proposes to refer specifically to the AR5 to define the concepts related to the CRVA, in order to ensure consistency with the NAP-UNEP framework. However, the contributions from AR6, and the knowledge from this report will be incorporated into the CRVA.

societies, cultures, services, and infrastructure due to the interaction of climate changes or hazardous climate events occurring within a specific time period and the vulnerability of an exposed society or system. Impacts are also referred to as consequences and outcomes. The impacts of climate change on geophysical systems, including floods, droughts, and sea level rise, are a subset of impacts called physical impacts

Risk: The potential for consequences where something of value is at stake and where the outcome is uncertain, recognizing the diversity of values. Risk is often represented as probability of occurrence of hazardous events or trends multiplied by the impacts if these events or trends occur. Risk results from the interaction of vulnerability, exposure, and hazard. In this report, the term risk is used primarily to refer to the risks of climate-change impacts.

In addition, and based on other sources, the consultant has provided the following definition for the climate related stressors based on the *U.S climate Resilience Toolkit*.

Climate related stressors: A climate-related stressor refers to a condition, event, or trend associated with climate variability and change, which can either exacerbate existing hazards or introduce new ones. These stressors, often linked to shifts in climate conditions, pose significant risks or challenges to both natural and human systems. In this report, climate-related stressors are specifically defined as changes in climate conditions or trends tied to climate variability. *Example: increasing frequency and intensity of drought conditions can be a climate stressor for forests and crops.*

2.2 Description of the methodology

2.2.1. Hazards assessment

2.2.1.1 General approach

As previously mentioned, the consultant will primarily focus on the report 'Lao PDR Provincial Storyline-based Climate Risk, Vulnerability and Adaptation Assessment' for the hazard analysis. However, as per the ToR, special attention will be given to both **drought and flooding**. To do so, the consultant will specifically focus on two climate parameters: precipitation levels and temperature changes. However, if the consultant deems it necessary, complementary literature or reports will be used as additional sources.

A definition of floods and droughts is provided below, taken from the report “Lao PDR Provincial Storyline-based Climate Risk, Vulnerability and Adaptation Assessment”.

Definitions of floods

A flood is an overflow of water onto normally dry land. This can be caused by rising water in an existing waterway, such as a river, stream, or drainage ditch (fluvial flood), or due to ponding of water at or near the point where the rain fell without the need for an overflowing water body (pluvial flood). Flooding is a longer-term event than flash flooding and it may last days or weeks. **A flash flood** is a flood caused by heavy or excessive rainfall in a short period of time, generally less than 6 hours. Flash floods are usually characterized by raging torrents after heavy rains that rip through riverbeds, urban streets, or mountain canyons sweeping everything before them. They can occur within minutes or a few hours of excessive rainfall. They can also occur even if no rain has fallen, for instance after a levee or dam has failed, or after a sudden release of water by a debris or ice jam.

Definitions of droughts

A meteorological drought happens when dry weather patterns dominate an area. Such a drought may or may not have impacts on the water availability, agricultural production and ecosystems' health in a region.

A hydrological drought occurs when low water supply becomes evident, especially in streams, reservoirs, and groundwater levels, usually after many months of meteorological drought.

An agricultural or an ecological drought is one that affects crops or ecosystems. They are both due to hydrological and meteorological droughts but are also heavily influenced by land and water management.

For the hazard analysis, the consultant will collect data and analyses conducted as part of the report 'Lao PDR Provincial Storyline-based Climate Risk, Vulnerability and Adaptation Assessment.' To understand how this analysis was carried out, the consultant has detailed below the methodological approach that guided the hazard analysis at the scale of the 6 provinces studied.

As requested by GGGI, the analysis presented in the "Lao PDR Provincial Storyline-based Climate Risk, Vulnerability and Adaptation Assessment" report will be complemented by a mapping analysis using an internal tool developed by the consultant, based on data from the CMIP6 climate model. Wherever possible, the consultant will cross-analyse the results from both approaches to ensure consistency and enhance the robustness of the findings.

The consultant wishes to draw the client's attention to potential inconsistencies between the analyses due to the use of different datasets. In such cases, the consultant reserves the right to rely on one set of results (*based on stakeholders Focus Group Discussions*) over the other or adjust the methodology for consistency purposes.

2.2.1.2 Hazard screening

Before focusing on droughts and floods, the consultant will perform a hazard screening at the national scale to provide a broader picture of hazards that threaten the Lao PDR. Based on the NAP-UNEP and the "Lao PDR Provincial Storyline-based Climate Risk, Vulnerability and Adaptation Assessment", the consultant will detail the hazards and natural disasters that have impacted the country over the past 10-20 years from now, as well as the current hazards the

country is facing. If necessary, the consultant will use other sources of data as Climate Knowledge portal (Word Bank) or Think Hazard³.

2.2.2. Hazard analysis (based on the Lao PDR Provincial Storyline-based Climate Risk, Vulnerability and Adaptation Assessment)

Regional Climate Models (RCMs) selection

RCMs were selected from the CMIP5 global climate models, which provide various climate projections for different emission scenarios (RCP2.6, RCP4.5, and RCP8.5). The models were chosen to capture a broad spectrum of climate projections, including temperature and precipitation variations.

Projections

Projections are made using downscaled climate models and Representative Concentration Pathways (RCPs). The models are chosen to represent a broad range of climate scenarios, from low-emission (RCP2.6) to high-emission scenarios (RCP8.5). These pathways help project how different levels of greenhouse gas emissions could influence the climate in the future. For instance:

- ▶ **RCP2.6** assumes significant emissions reductions, resulting in a lower global temperature increase (around +2°C by the end of the century).
- ▶ **RCP4.5** represents a moderate emissions scenario, with a projected temperature increase of 2.5-3°C.
- ▶ **RCP8.5** models a high-emission scenario, resulting in a temperature increase of around 4°C by 2100.

These RCPs form the basis of the climate projections, which guide the hazard analysis. The projections were then used to create climate storylines specific to the provinces, considering both the temperature and precipitation changes under each RCP. The assessment explicitly integrates regional climate models (RCMs) to downscale these global projections, offering more localized insights.

Time Horizon

The time horizon for the projections extends from **2020 to 2100**, with particular emphasis on the **mid-century period (2046–2065)** and the **century's end (2081–2100)**. Projections for both temperature and precipitation changes are calculated based on historical averages (1980-2000), with future deviations analyzed. For each time period, a 20-year moving average is used to smooth out short-term variability, emphasizing long-term climate trends.

Quantitative and qualitative analysis

The “Lao PDR Provincial Storyline-based Climate Risk, Vulnerability and Adaptation Assessment” report provides a quantitative analysis of temperature and precipitation changes, highlighting how these variables evolve over time across different regions of Laos. It also includes qualitative assessments, such as the projected frequency of hot days, wet days, and dry spells, along with

³ The tool highlights the likelihood of different natural hazards affecting project areas (very low, low, medium and high),

their potential implications for the local environment, agriculture, and infrastructure. The assessment **uses qualitative descriptions to rank the severity of the hazards (e.g., minor, moderate, or major)**. For example, minor impacts would result in a less than 30% reduction in system capacity, while major impacts would reduce capacity by 80%. This helps inform the severity and frequency of the risks, even when quantitative data is limited.

2.2.3. Climate data hazard trends mapping

In order to meet the client's request to visualize the hazards, the consultant proposes to create a mapping focusing on both floods and droughts, at the national level as well as at the level of the 6 provinces under study. The methodology for creating these maps is detailed below.

Data collection



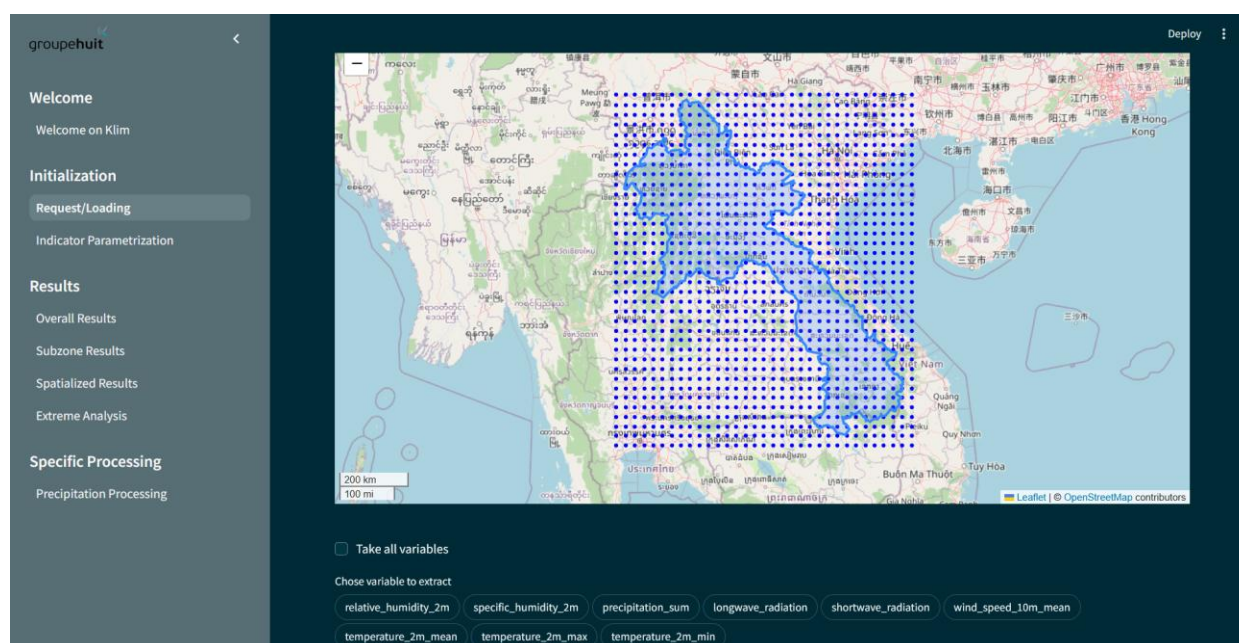
In order to perform the analysis, data will be collected through the use of **K'lim tool**, a tool developed internally by Groupe Huit, and which relies on python Application Programming Interfaces (APIs) to extract historical and projected daily climatic variables.



Python, as a high-level and versatile programming language, is known for its readability and extensive libraries. In risk mapping and disaster risk management, Python is especially useful when integrated with GIS tools like ArcPy (for ArcGIS) and GeoPandas (for open-source GIS). It enables automation of spatial data processing, analysis of hazard exposure and vulnerability, and visualization of risk layers. Python also supports integration with remote sensing data, early warning systems, and statistical models, making it a powerful tool for informed decision-making in disaster risk reduction. The K'lim [?](#) leverages powerful APIs to extract climate data from reputable sources such as the European Space Agency (ESA) and National Aeronautics and Space Administration (NASA).

It performs advanced statistical processing of climate variable time series at various temporal resolutions, ranging from hourly to daily scales. The tool integrates historical climate data, either from local observations or satellite-derived sources, and projected data with future climate projections generated from Global Climate Models (GCMs) within CMIP6 (*various SSPs available*).

Figure 3: Overview of K'lim Tool



The following parameters will be extracted:

- Daily Cumulated Precipitation (mm)
- Mean and Maximum Daily Temperature (°C)

It is important to note that for its internal tool, Groupe Huit uses the CMIP6 model, which is based on **Shared Socioeconomic Pathways (SSPs)**, whereas the analysis provided in the report “Lao PDR Provincial Storyline-based Climate Risk, Vulnerability and Adaptation Assessment” primarily relies on CMIP5 global climate models, which use **Representative Concentration Pathways (RCPs)**. To facilitate understanding and comparison, the consultant proposes the table below and will develop maps aligned with the same time horizons used in the “Lao PDR Provincial Storyline-based Climate Risk, Vulnerability and Adaptation Assessment”. Also, **RCPs** will be used for the CRVA analysis.

Table 1: Table summarizing the differences between SSPs (CMIP5 and CMIP6)

	CMIP5	CMIP6
Released	~2010	~2019
Scenario Framework	RCPs only (e.g., RCP4.5, RCP8.5)	SSP-RCPs (e.g., SSP1-2.6, SSP5-8.5)
Radiative Forcing	Fixed levels by 2100 (e.g., 2.6, 4.5 W/m ²)	Combines forcing with socioeconomic storylines
Socioeconomic Dimension	Limited or separate from climate modeling	Integrated via SSPs (population, land use, GDP, energy)

Model Improvements	Lower resolution, fewer Earth system interactions	Higher resolution, better clouds, aerosols, land-carbon links
Use Cases	Climate projections, mitigation scenarios	Policy analysis, risk assessment, adaptation planning

Figure 4: Equivalence SSPs (CMIP6) and RCPs (CMIP5)

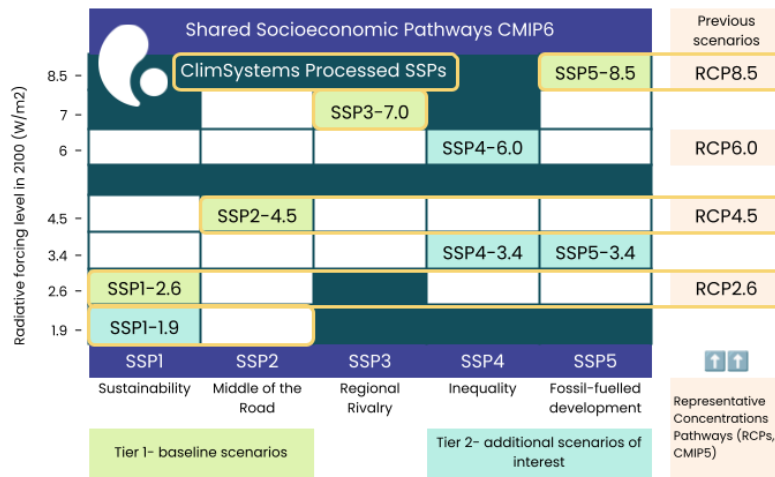
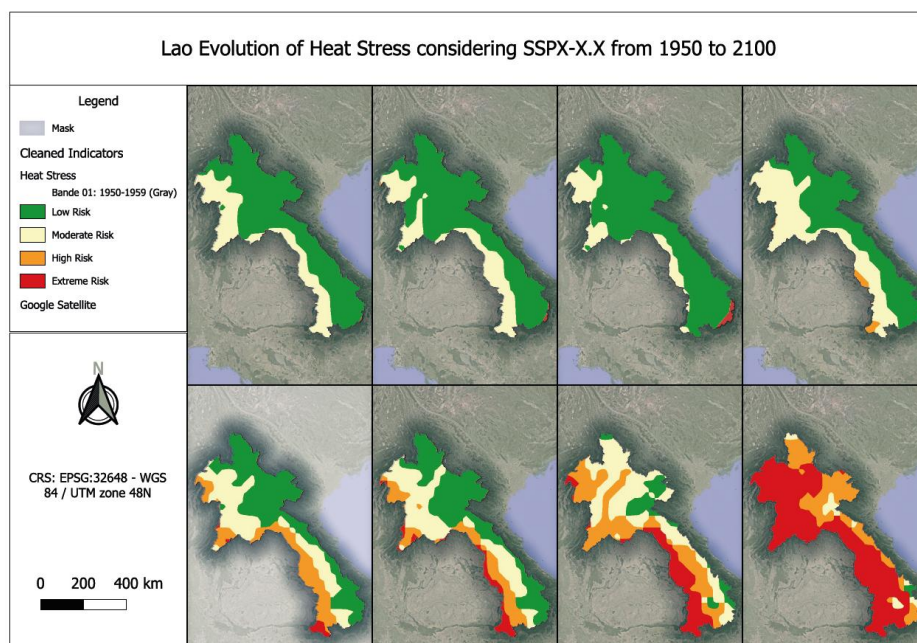


Figure 1. IPCC AR6 Shared Socioeconomic Pathways compared with CMIP5 Representative Concentration Pathways (RCPs)

Furthermore, for the sake of harmonization, the consultant proposes to use the same RCPs and time horizons as those used in the “Lao PDR Provincial Storyline-based Climate Risk, Vulnerability and Adaptation Assessment” report for the mapping analysis.

Figure 5: Example of maps



2.2.4 Sectoral Impacts assessment (exposure and vulnerability)

2.2.4.1 General approach

To conduct the impact analysis, the consultant will first carry out an exposure and vulnerability analysis by sector. This analysis will be based on the work conducted in the 'Lao PDR Provincial Storyline-based Climate Risk, Vulnerability and Adaptation Assessment,' but also an analysis of sectoral documents and existing literature, as well as on the various sectoral Focus Group Discussions. To assess the risks and study the impacts while evaluating their significance, a narrative analysis will be conducted, along with an analysis matrix based on a scoring / color-coded system.

2.2.4.2 Sectoral exposure assessment

In order to analyze the impacts of climate risks and understand their interrelations and cascading effects, the consultant has classified them. The objective is to identify, **for each sector, the categories of assets exposed to flood and drought risks.**

Based on the NAP-UNEP and the “Lao PDR Provincial Storyline-based Climate Risk, Vulnerability and Adaptation Assessment analysis”⁴ and following the inception workshop, a classification is detailed below (see Table 2: Example of sectors and hazard exposure analysis table).

The exposure assessment will involve:

1. Describing each category/sub-category in the context of Lao PDR, detailing the key issues.
2. Explaining which hazard and how floods or droughts impact these categories and the type of exposure
3. Determining a level of exposure based on the level of hazard severity through a scoring system (0 – low to 3 – high), relying on the consultant's expertise and, most importantly, discussions with stakeholders from each sector during the sectoral Focus Group Discussions. In line with the proposed scoring, an exposure level (low-medium-high) and a specific color-code system will be associated (green, orange, red).

Level of exposure	Color code
Low	Green
Medium	Orange
High	Red

This section will be both narrated and summarized in a table / matrix, which could take the form below. This table will be completed as part of the CRVA report and, in the context of this document, is provided for illustrative and indicative purposes to detail our methodology

⁴ National Adaptation Plan – Draft version - 2023

Table 2: Example of sectors and hazard exposure analysis table

Sector	Categories	Sub-categories	Severity of hazards	Level of exposure	
Agriculture & forestry	Agriculture yields	Crops (Rice, maize, cassava, banana, coffee, tea, rubber)			
	Livestock / Fish	Livestock (cattle, pigs, poultry, buffalo) Fish stock (aquaculture and wild fish)			
	Non-timber forest products	Fruits, vegetables, bamboo shoots,			
	Soil quality	Agriculture land			
	Forest biodiversity	Forest composition, land-use			
Urban development & transport	Urban infrastructures	Roads, bridges, buildings, ports, ITC, hydraulic			
	Degradation of urban ecosystems	Green spaces, parks, urban forests			
	Urban clean-up	Sanitation infrastructures, flood debris			
	Hydraulic infrastructure (urban areas)	Drainage systems, stormwater infrastructure, flood barriers			
Water resources	River and reservoir flows	Rivers, reservoirs, dams, irrigation systems			
	Hydraulic infrastructure	Dams, reservoirs,			

		pumping stations, levees			
	Water quality	Water bodies (rivers, lakes, reservoirs, groundwater)			
	Groundwater management	Groundwater resources			

2.2.4.3 Sectoral vulnerability assessment

The vulnerability refers to the physical predisposition of human beings, infrastructure, and environment to be affected by hazards due to a lack of resistance and predisposition to suffer harm as a consequence of intrinsic and context conditions making it plausible that such systems once impacted will collapse or experience major harm and damage due to the influence of a hazard event. The vulnerability thus encompasses both the adaptive capacity (susceptibility) and intrinsic sensitivity (or lack of resilience). The vulnerability has various components: physical, ecological, social, economic, cultural and institutional that will be taken into account for each sector. GEDSI considerations and related factors of vulnerability as well as ongoing projects and initiatives, will be also taken into account.

The levels of vulnerability will be primarily determined based on the analysed sectoral reports, and the “Lao PDR provincial storyline-based climate risk, vulnerability and adaptation assessment” report. The level of vulnerability will also be discussed and confirmed during the sectoral Focus Group Discussions and the and the CRVA validation workshop.

So, for each sector and categories determined, we will describe and evaluate 2 types of vulnerabilities: environmental and socio-economic in alignment with the “Lao PDR provincial storyline-based climate risk, vulnerability and adaptation assessment” methodology.

It is important to note that the consultant proposes to detail the sensitivity factors and adaptive capacities in order to identify the strengths on which to build a robust adaptation strategy (which is not part of the “Lao PDR provincial storyline-based climate risk, vulnerability and adaptation assessment” methodology)

The vulnerability assessment framework and the initial elements of vulnerability analysis based on the methodology of the 'Lao PDR Provincial Storyline-based Climate Risk, Vulnerability and Adaptation Assessment' document are provided below and will be completed during the CRVA completion through the analysis of sectoral documents. These vulnerabilities and adaptive capacities will be discussed and supplemented during the Focus Group Discussions.

The vulnerability analysis involves:

- A description for each category of sensitive factors and adaptive capacities, informed by the literature review and discussions with local stakeholders.
- Determining a level of vulnerability based on the level of sensitivity/adaptive capacity through a scoring system (0-low – 3-high), relying on the consultant's expertise and, most importantly, discussions with stakeholders from each sector. In line with the proposed scoring, a risk level (low-medium-high) and a **specific color-coded system (green-orange-red)** will be associated.

Table 3: Examples of sensitive factors and adaptive capacity per sector

Sector	Categories	Sensitive Factors (environmental)	Sensitive Factors (Socio-economic)	Adaptive Capacity	Level of vulnerability
Agriculture & Forestry	Agriculture yields	- Reliance on rainfed farming systems - Land and soil degradation - Pest - Weeds - Climate and weather conditions - Soil characteristics - Water resources	- Small sizes of farm - Weak road infrastructure and isolation - Limited access to agricultural infrastructure (irrigation, machineries to farm, transport vehicles, safe harvest storage) and to inputs (fertilizers and pesticides) limit productivity - Limited technical knowledge and lack of sufficient agricultural extension support - Low education - Ethnicity and language barriers - Weak land rights - Foreign investors gaining access to farm on land - Unexploded ordnance - Volatility of cash crops prices	- Awareness and training, irrigation systems, crop diversification financial support - Government agricultural resilience programs, climate-smart agriculture initiatives: irrigation systems, crop diversification, use of drought-resistant varieties - Early warning systems, farmer education - Water management systems	

Sector	Categories	Sensitive Factors (environmental)	Sensitive Factors (Socio-economic)	Adaptive Capacity	Level of vulnerability
			- Volatility of fuel, fertilizer and animal feed prices - High dependency on external markets for demand - Shrinking agricultural labour force and youth migration to cities - Growing population		
	Livestock / fish	Grazing land degradation - Disease outbreaks, water shortage - Soil degradation and depletion - Water quality - Degradation of aquatic ecosystem	- Weakness in animal health management - Lack of access to medicines - Lack of cool stables - Lack of water storage to conserve water for dry season - Insufficient income or access to finance to purchase fodder - High dependency on fishing for food security in poor communities	- Improved veterinary services, livestock insurance, climate-resilient breeding practices - Livestock adaptation projects, drought management programs - Fishery management, insurance, climate resilient breeds, water conservation techniques	
	Soil quality	- Soil erosion - Reduced organic matter - Poor soil moisture retention		- Soil conservation techniques - Agroforestry practices, mulching - Use of organic fertilizers - Education and capacity-building - Soil rehabilitation and conservation projects	
	Forest	Land degradation	- Weak land rights - Decrease in income diversification	- Sustainable land management practices - Forest regeneration programs - Local community engagement	

Sector	Categories	Sensitive Factors (environmental)	Sensitive Factors (Socio-economic)	Adaptive Capacity	Level of vulnerability
		- Deforestation, grazing and burning - Species diversity loss - Unsustainable land use and agricultural expansion	- Forest investors gaining access to farm on land - Growing population - Ethnic minorities face challenges	- Forest conservation and afforestation projects - Ecosystem restoration and conservation	
Urban Development & Transport	Infrastructures		- Aging infrastructure - Poor maintenance and insufficient design to extreme events (roads not paved – poor roads quality)	- Infrastructure upgrades, climate-resilient urban planning, financial support for retrofitting - Urban resilience initiatives, infrastructure and upgrade programs - Flood and stormwater management such as urban drainage systems	
	Urban ecosystems	- Loss of green spaces due to urbanisation process, - Pollution - Reduced biodiversity		- Urban greening - Adaptation planning - Integration of green spaces in urban design - Community-led environmental initiatives	
	Urban clean-up	- Sanitation challenges - Public health		- Waterborne disease prevention programs, - Improved waste management	

Sector	Categories	Sensitive Factors (environmental)	Sensitive Factors (Socio-economic)	Adaptive Capacity	Level of vulnerability
				Sanitation infrastructure upgrades	
	Water infrastructure	- Contamination of water sources - Overwhelmed drainage systems	Poor maintenance of irrigation infrastructure - Urban expansion - Inefficient drainage systems and poor water management	Development of flood control measures Stormwater management systems, awareness campaigns	
	Hydraulic infrastructure		- Aging, inefficient or poorly designed water infrastructure - Poor material and poor design of dams, especially small dams that do not undergo - Strong vetting processes	- Structural reinforcement - Risk assessment models - Adaptive flood management - Hydraulic infrastructure adaptation initiatives	
Water resources	Water quality	- Polluted runoff, sedimentation - Algal blooms during floods - Contamination from industrial activities	- Lack of sanitation - Inefficient drainage systems and poor water management - Intensive agricultural practices contributing to nutrient and chemical runoff - Rapid urbanisation and industrial pollution - Hydropower projects can degrade water quality by altering temperature and oxygen levels - Mining operations releasing toxic substances,	- Pollution control measures - Wastewater treatment plants - Community-based water quality monitoring - Water quality improvement and pollution control programs	

Sector	Categories	Sensitive Factors (environmental)	Sensitive Factors (Socio-economic)	Adaptive Capacity	Level of vulnerability
			including heavy metals and acids, into nearby water sources Transboundary river operations		
	River and reservoir flows	- High level of sedimentation - Soil erosion favour landslides	- Aging, inefficient or poorly designed water infrastructure - Reliance on hydropower for energy - Water dependance in agriculture - Over extraction: Rapid urbanisation	- Integrated water resources management - Reservoir regulation, demand-side management - National water resource management projects	
	Groundwater management	Salinization, contamination from flooding or industrial activities	- Over-extraction: Water dependance in agriculture - Rapid urbanization	- Groundwater recharge programs - Sustainable extraction practices - Monitoring systems - Groundwater recharge and sustainable management projects	

2.2.5. Risk / impact assessment

Based on the hazard study and the exposure and vulnerability analysis, the consultant will describe all the impacts of flood and drought risk (primary, secondary, and tertiary) for each sector. The impact analysis will be guided by the various sectoral reports from the IPCC, which provide a clear understanding of climate change-related impacts. Additionally, other reports conducted at the national level for Laos will also be incorporated. An example of impact assessment and description is provided below and will be readjusted based on the context and literature review and interviews / meetings with key stakeholders.

For Agriculture and Forestry:

- **Primary impacts:** Reduced agricultural productivity, increased prevalence of pest diseases, soil degradation, alteration of species composition, and a decrease in natural forest regeneration.
- **Secondary impacts:** Food insecurity driven by disruptions in food production and trade, leading to increased reliance on imports and volatility in exports; economic losses in rural communities dependent on agriculture and forestry.
- **Tertiary impacts:** Migration patterns of species, including forest and agricultural pests; destruction of livelihoods, particularly in rural and forest-dependent communities, due to the loss of biodiversity and the degradation of the natural environment.

For Urban Development and Transport:

- **Primary impacts:** Increased health risks such as heat stress and mortality due to rising temperatures; physical damage to infrastructure, including roads, bridges, and buildings from extreme weather events like floods and storms; loss of biodiversity in urban areas due to the urban heat island effect and reduced green spaces.
- **Secondary impacts:** Elevated healthcare costs due to the rise in climate-related diseases; economic losses from the destruction of infrastructure and transport networks, which disrupt local economies; deterioration in the quality of life, particularly in low-income urban areas, as access to basic services is impaired by climate events.
- **Tertiary impacts:** Displacement and migration within urban areas due to extreme weather events, leading to overcrowded informal settlements; the socio-economic divide between urban centers and rural areas may widen as climate impacts further strain urban infrastructure.

For Water Resources:

- **Primary impacts:** Altered River flows and reduced water availability due to changes in precipitation patterns and increased evaporation rates; contamination of water sources due to floods, leading to the degradation of water quality.
- **Secondary impacts:** Impacts on hydropower generation capacity due to fluctuating water levels, affecting energy production and distribution; scarcity of water resources for agriculture, industry, and domestic consumption.
- **Tertiary impacts:** Disruption in water-related trade and regional cooperation, particularly along transboundary river systems like the Mekong; potential geopolitical tensions over water resources due to reduced availability.

Then a risk analysis table (or matrix) will be summarized in a table based on the same scoring system previously developed. The level of risk will be calculated by the following formula.

$\text{Risk} = (\text{severity of hazard} * \text{sensitive factors}) - \text{adaptive capacities}$

A summary of the main impacts for each hazards / category and sub-categories per hazard will also be provided in the CRVA report.

Table 4: Examples of risk and impacts assessment per sector

Sector	Categories	Severity of hazards	Sensitive Factors (environmental)	Sensitive Factors (Socio-economic)	Adaptive Capacity	Level of risk	List of impacts (primary, secondary, tertiary)
Agriculture & Forestry	Agriculture yields						
	Livestock / fish						
	Soil quality						
	Forest						
Urban Development & Transport	Infrastructures						
	Urban ecosystems						
	Urban clean-up						
	Water infrastructure						
	Hydraulic infrastructure						
Water resources	Water quality						
	River and reservoir flows						
	Groundwater management						

2.2.6. A systemic approach of climate and anthropogenic pressures

The consultant proposes conducting a specific analysis on the interaction between climate impacts and how anthropogenic factors amplify these effects. This approach involves a systematic view of climate change impacts and anthropogenic influences which aligns with the ToRs emphasis on integrating a comprehensive analysis of sectoral vulnerabilities.

To achieve this, we suggest performing a schematic systemic analysis followed by a detailed written assessment. We recommend that this systemic analysis be developed and discussed during a workshop, based on the schematic model, as part of the CRVA validation workshop.

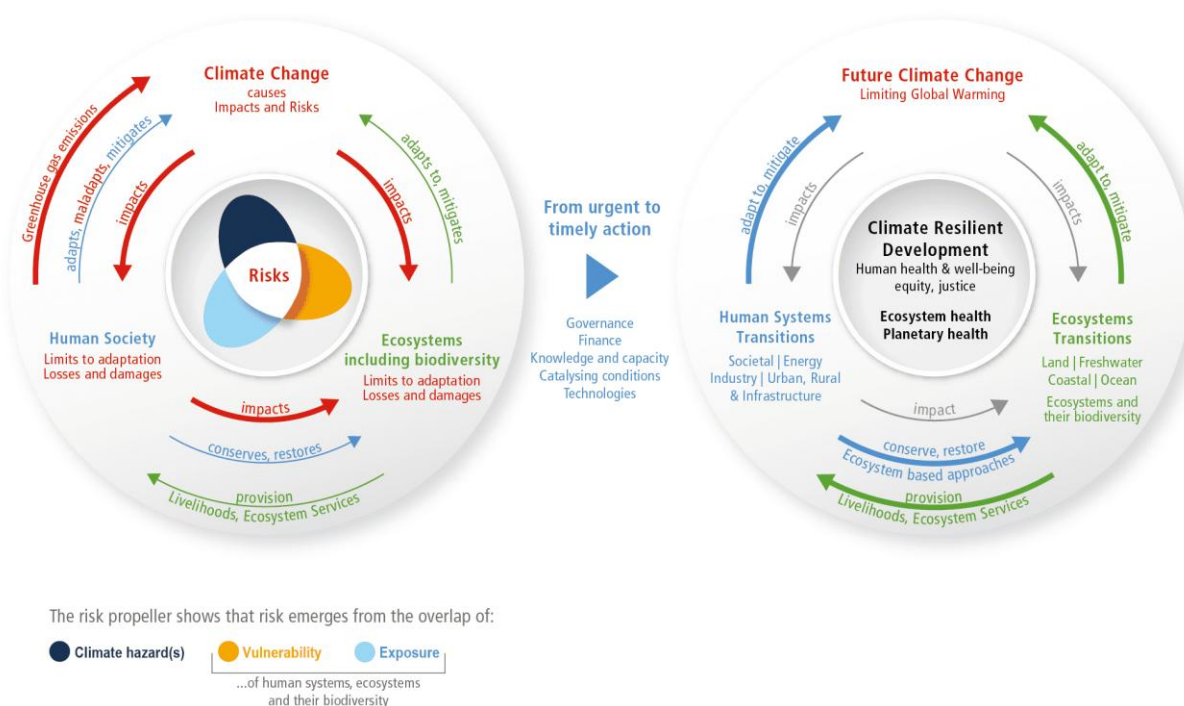
This workshop will focus on the findings and insights derived from the schematic of the IPCC's *Summary for Policymakers – Climate Change 2022: Impacts, Adaptation, and Vulnerability* report. IPCC's *Summary for Policymakers* ensures the methodology is grounded in internationally recognized frameworks, aligning with the ToRs' expectations for using credible sources of climate information.

Figure 6: Climate risk to climate resilient development: climate, ecosystems (including biodiversity) and human society as coupled systems (IPCC, 2022)

From climate risk to climate resilient development: climate, ecosystems (including biodiversity) and human society as coupled systems

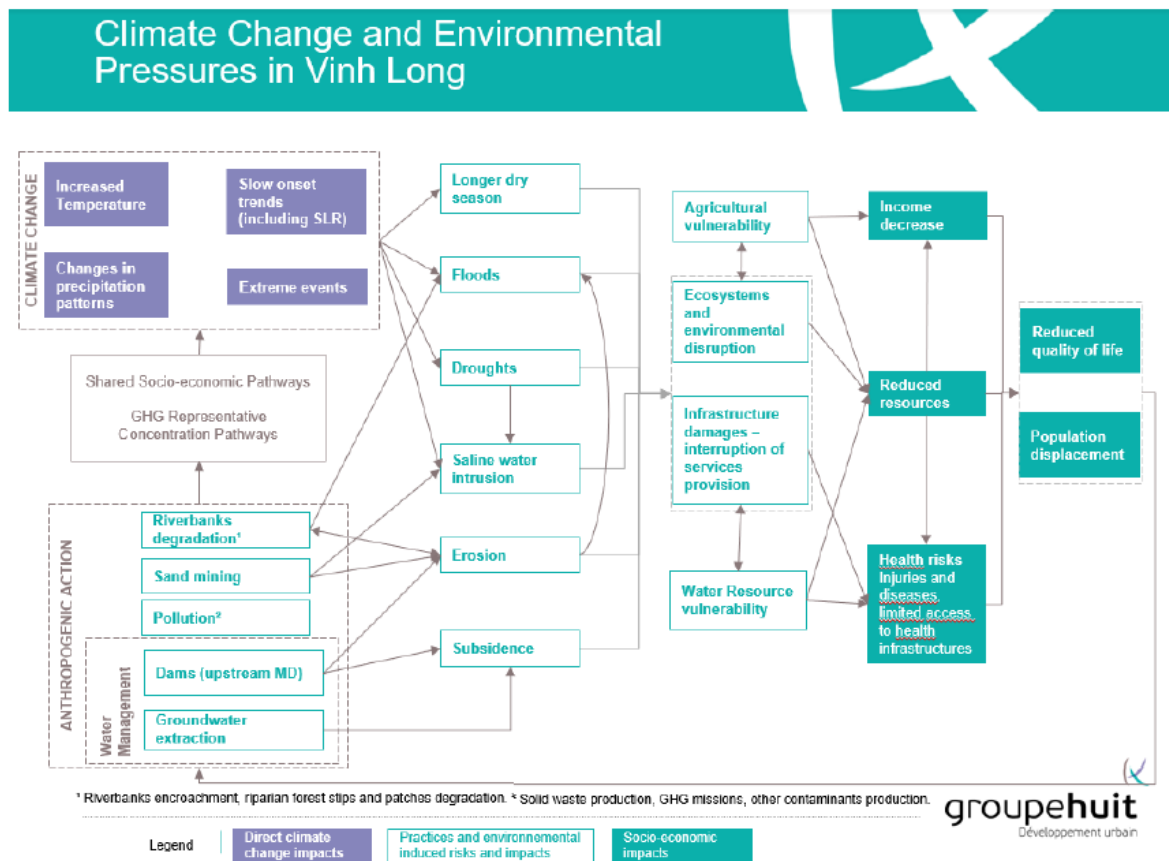
(a) Main interactions and trends

(b) Options to reduce climate risks and establish resilience



Below is an example of climate change and environmental pressures mapping that we carried out on another project. We will be able to propose a similar mapping, tailored to the local context and informed by the findings of our studies.

Figure 7: Example of Climate Change and Environmental Pressures mapping



2.2.7. Adaptation recommendations

First orientations and recommendations will be provided based on the document “Lao PDR Provincial Storyline-based Climate Risk, Vulnerability and Adaptation Assessment”, the NAP and the sectorial documents which have been reviewed. A first list of actions is provided following the analysis of this document in section 3.

2.2.8. CRVA report

The above activity results will be disclosed in a CRVA report which will include clear sections regarding each sector analysis.



2.3 Hazards screening and climate hazards initial findings and climate-related stressors

2.3.1. Climate in Lao PDR and climate trends⁵

Lao PDR is characterized by a tropical climate, influenced by the southeast monsoon which brings 70% of annual rainfall and high humidity. There are two distinct seasons: the rainy season, or monsoon, from May to mid-October and the dry season from mid-October to April, presented in the latest climatology (1991–2020). Average rainfall can be as high as 3,000 millimeters (mm) per year. Mean annual

⁵ Based on the NAP-UNEP report

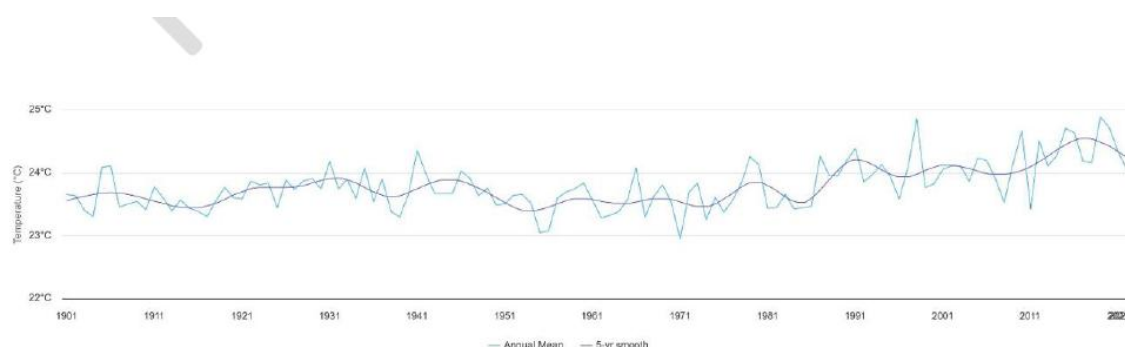
temperatures of 20°C was observed in the northern and eastern mountainous areas and the plateaus, whereas temperatures are higher in the plains at 25–27°C⁶.

Based on the country's altitude, Lao PDR can be divided into three different climatic zones. The northern mountainous areas above 1,000 meters (m) have a mountain temperate and hilly sub-tropical climate. Here, temperature ranges are lower than the rest of the country. The central mountainous areas in the Annamite Chain vary in altitude between 500 to 1,000 m and are characterized by a tropical monsoonal climate with high temperatures and average rainfall totals. More than 50% of the population lives in the tropical lowland plain and floodplains along the Mekong River and its main tributaries. Temperature and precipitation rates have been shown to be sensitive to El Niño Southern Oscillation (ENSO), but generally to a lesser extent when compared to other Southeast Asian nations.

Historically, the temperature in Lao PDR has been rising. Between 1951 and 2020, data show that the country has warmed by approximately 0.8°C to 1.0°C. This warming has not been uniform across the territory or the seasons:

- The highest temperature increases have been observed in the central and southern provinces, particularly during the cool dry season (November–February), which has shown warming of up to 0.3°C per decade.

Figure 8: Temperature variation (1901-2020)



Source: World Bank

- The number of very hot days (>35°C) has increased across most of the country. In the 1980s, such days were rare outside the southern lowlands. By the 2010s, many parts of the country experienced 20–40 hot days per year, particularly in April and May.

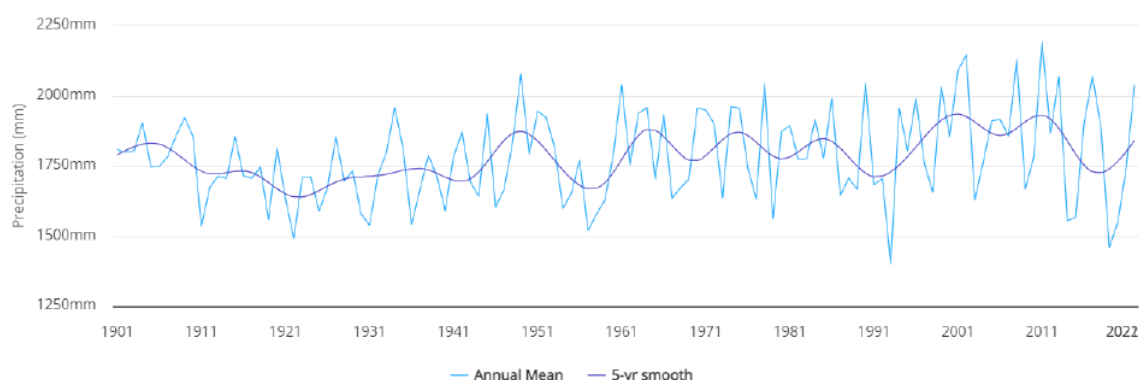
Regarding precipitations, rainfall in Lao PDR has always been highly seasonal, but recent decades have brought significant intra-seasonal variability and changing monsoon behavior. From 1961 to 2020, the following trends were observed:

- While total annual rainfall has not changed significantly at the national level, its distribution has become increasingly erratic.
- The onset of the rainy season has become less predictable, often arriving later than average, while the intensity of rainfall within short periods has increased.
- The length of the wet season is shortening, with more rain falling in fewer days.

⁶ ADB (2021). Climate risk country profile: Lao PDR (access at: [Climate Risk Country Profile: Lao PDR](#))

However, a general trends shows that increasing trend in rainfall over the country from 1901 to 2022. During the period 1961-1985, the average amount of rain is about 1850 mm/year (100 mm higher than previous years). The amount of rainfall was less than 1750 mm/year in the 1990s. However, the amount of rainfall increased greatly in the years 2001-2011 to about 1900 mm/year.

Figure 9: Rainfall average (1901-2022)



2.3.2. Climate hazards screening⁷

This section presents a hazard screening conducted at a national level, providing an overall perspective of climate and environmental risks, as a more detailed, sector-specific analysis will be developed later in the CRVA report.

Over the past three decades, Lao PDR has experienced an increasingly diverse range of climate-related hazards. These events have not only caused widespread human and economic losses. This hazard screening synthesizes major historical events and scientific evidence across key hazard categories.

Table 5: Summary table of hazards and their impacts on the Lao PDR

Hazard	Historical Incidence (2000–2020)	Impacts	General trends
Floods	Frequent riverine and flash floods; notable major floods in 2011, 2013, and others.	2013 flood: Affected 350,000+ people, damaged 15,000 ha of rice, destroyed infrastructure.	Increasing trend in flood frequency and intensity; climate change expected to double annual exposure.

⁷ Based on the NAP-UNEP report

Droughts	Severe events in 2015 (El Niño year); historically occur every few years.	Damaged tens of thousands of hectares of rice and fruit crops; reduced water availability.	Projected increase in drought probability and intensity under warming scenarios.
Storms	Tropical storms affect Lao PDR occasionally, with back-to-back storms in 2011 requiring humanitarian response.	Caused flooding, landslides, and sanitation crises; disrupted transport and health services.	Storm-related hazards (especially from remnants of tropical cyclones)—such as intense rainfall—are expected to increase over the next 20–25 years.
Landslides	Often triggered by intense rainfall and floods; frequently underreported.	Common in mountainous areas; damages include infrastructure collapse and community displacement.	Understudied but likely increasing due to more intense precipitation and deforestation.
Heatwaves	Observed increase in extreme temperature events, especially post-2010.	Health stress, reduced labor productivity, and crop yield losses.	Probability of heatwaves expected to rise significantly by 2080–2099 under RCP8.5.

2.3.2.1 Floods

Flooding is the most frequent and geographically widespread hazard in Lao PDR, historically accounting for over 70% of all climate-related disasters. Lao PDR is in fact extremely vulnerable to floods with the INFORM Country Profile showing a score of 9.1 on a scale of 0 – 10 for risk to floods⁸.

Lao PDR experiences multiple types of flooding—including riverine, flash, urban, dam-related, and backwater floods—each with distinct mechanisms but increasingly overlapping consequences. The 2013 monsoon floods affected nearly 395,000 people across 12 provinces and resulted in significant infrastructure damage. In 2018, Tropical Storm Son-Tinh triggered the Xe-Pian Xe-Namnoy dam collapse in Attapeu Province, leading to one of the most catastrophic flash floods in the country's history, with dozens of fatalities, the destruction of entire villages, and over US\$164 million in damages.

More recently, in 2024, Typhoon Yagi caused widespread flooding in northern provinces such as Luang Namtha and Oudomxay, damaging hundreds of homes, schools, and health facilities, and displacing over

⁸ UNDP. (2009). NATIONAL ADAPTATION PROGRAMME OF ACTION TO CLIMATE CHANGE: LAO PDR. United Nations Development Programme (UNDP).

300 people. The total economic cost was estimated at US\$32.5 million. These events illustrate both the recurrent nature and increasing intensity of flood events, exacerbated by erratic rainfall patterns, deforestation, and inadequate drainage in expanding urban areas.

2.3.2.2 Droughts

Droughts in Lao PDR have had severe and recurrent impacts, particularly on food security and water availability. Historical data indicates that over 3 million people have been affected by droughts since 1980.

The 1998 drought, associated with an El Niño event, affected 750,000 people and caused widespread crop failure. In 2010, an unusually weak monsoon season led to food shortages for 85,000 people, particularly in upland farming communities. The 2019 drought was among the most significant in decades, as the Mekong River fell to its lowest level in 60 years, affecting fisheries, hydropower generation, and rural irrigation.

Recurring drought conditions have led to declining rice yields, increased reliance on imported food, and heightened competition for water resources, especially in the dry season. These effects are compounded in rural areas where rain-fed agriculture dominates and access to irrigation remains limited.

2.3.2.3 Tropical storms

Although Lao PDR does not experience direct typhoon landfall, it remains highly vulnerable to remnant storm systems that move inland from the South China Sea. These systems often bring intense rainfall, strong winds, and trigger compound events like floods and landslides.

Notable events include Typhoon Ketsana in 2009, which caused US\$58 million in damage in southern provinces and left thousands of households displaced. In 2019, storms Podul and Kajiki brought consecutive rounds of heavy rain and flash flooding, affecting road access and agricultural lands across southern Laos.

Storms have also been directly linked to infrastructure failures—such as the dam collapse in 2018, demonstrating their ability to catalyze compound disasters with severe humanitarian and economic consequences.

2.3.2.4 Landslides

Landslides are increasingly common in the mountainous and deforested regions of Lao PDR, particularly during the rainy season. Provinces such as Xaysomboun, Khammouane, Sekong, and Attapeu have been identified as high-risk zones due to unstable slopes, poor land management, and intense rainfall.

In 2018, alongside widespread floods, landslides caused over US\$300 million in infrastructure damage, cutting off access to villages and hampering emergency response. Roads, bridges, and power lines are frequently affected, compounding the isolation of remote communities.

Although less deadly than floods or storms, landslides have a high economic cost and prolonged recovery periods, especially when they damage transport corridors and critical public infrastructure.

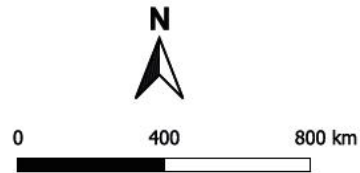
2.3.2.5 Emerging hazards

In recent years and due to climate change, Lao PDR has also begun to experience emerging hazards that, while previously rare, are increasing in frequency and intensity due to climate change.

- **Extreme heats events** : have become more common, with the number of hot days (>35°C) more than doubling in some regions. In April 2024, Luang Prabang recorded 42.7°C, among the highest on record.
- **Wildfires** are increasingly observed in upland areas during prolonged dry spells, affecting forests, air quality, and biodiversity.

In order to spatially illustrate hazard exposure across Laos, the consultant proposes mapping the hazards based on data available from the ThinkHazard platform.

THINK HAZARD EXPOSURE LEVEL PER DISTRICT IN Lao People's democratic Republic

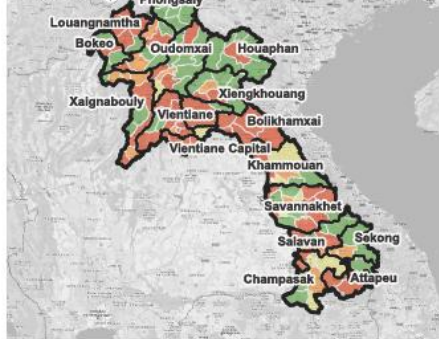


Source: <https://thinkhazard.org/fr/>

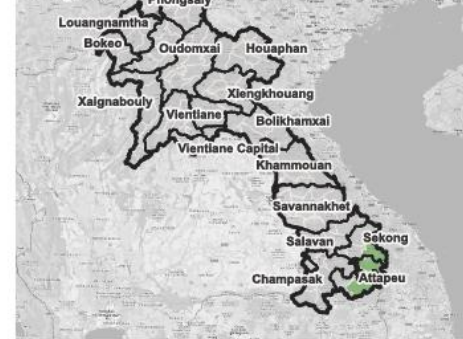
River Flooding



Urban Flooding



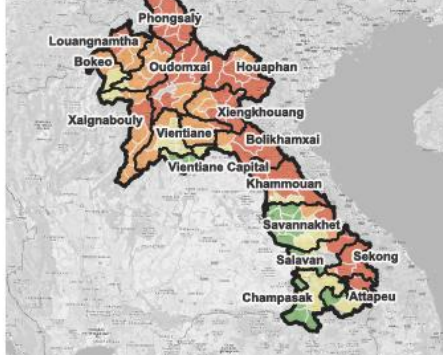
Volcanic eruptions



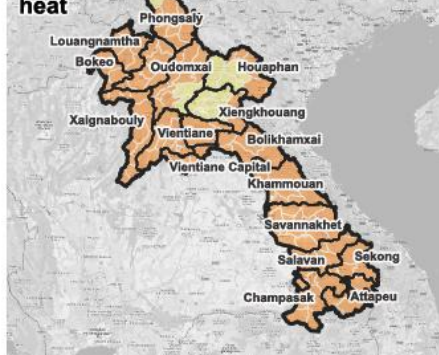
Earthquakes



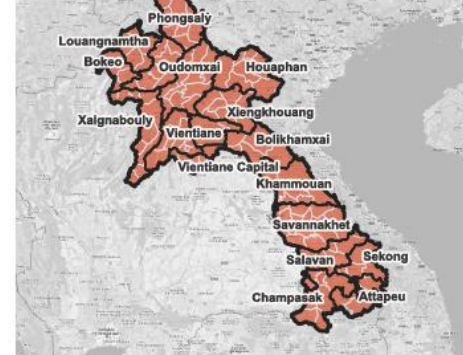
Landslides



Extreme heat



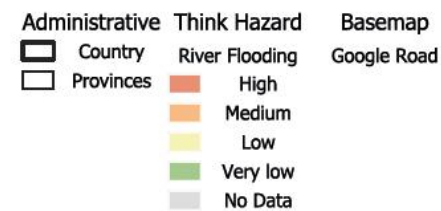
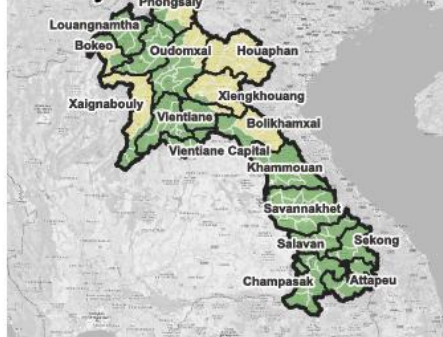
Wildfires



Cyclones



Water scarcity



3 Decision Making Support Tool and Adaptation Prioritization

3.1 Methodology for Prioritizing Adaptation Measures: Multi-Criteria Analysis

3.1.2. Data sources for Adaption Measures by Sector

Previous studies, most notably the NAP UNEP (v.6) and “Lao PDR Provincial Storyline-Based CRVA Assessment” have identified many potential adaption measures for the three sectors being studied under this GCF Readiness Support Project. Many of the adaption measures proposed under the NAP are generic national measures, many of which are intended to be further broken down into more localized Provincial or District measures for implementation.

The “Lao PDR Provincial Storyline-Based CRVA Assessment”, Walker Institute (2025) identified more specific adaption measures for each sector in each of the 6 selected Provinces: Oudomxay, Phongsaly, Xiengkhouang, Khammouane, Champasak and Xekong. These Provinces were selected to be representative of the country area, with 2 from the north, 2 central and 2 southern. This study also included sections on “barriers to adaption” which highlight challenges with adopting and actioning the proposed adaption measures in the local context. These “barriers to adaption” can assist in defining the scores and weightings of the MCA where appropriate.

The National Strategy on Disaster Risk Reduction (NSDRR 2021-2030) contains 7 recommended strategies that include adaptation measures relevant to water resources, urban development and transport, and agriculture.

In addition, the Consultant has identified further potential adaptation measures.

3.1.3. Long-list of Adaption Measures

A long list of over 360 proposed adaption measures by sector has been compiled from the sources above. Some of these are relatively simple single localized tasks (such as “hire and train personnel to prevent illegal logging”) whereas others are far more long term national objectives requiring improved policy, law and regulation and ongoing support and administration/implementation.

As many of the potential adaption measures are descriptive objectives rather than numerically defined objectives, the scoring and weighting to be used against each one of these needs to be defined with care, reasoning described, and final scorings and weighting discussed and agreed with stakeholders from each Sector. Tables summarizing the longlist of potential adaption measures compiled for each of the three Sectors are contained in Appendices 4-6.

3.1.4. Evaluation Criteria

The following criteria for evaluating the impacts of the adaption measures come from the NAP-UNEP study, with definitions amended to more closely reflect the realities in Laos and the three selected Sectors under this study.

- ▶ **Severity of climate change impacts:** activities are prioritized based on the severity of climate impacts they address. These impacts could range from extreme weather events (like floods and droughts) to long-term changes (such as increasing temperatures) that directly affect the agriculture, urban development, and water resources sectors.

- ▶ **Poverty reduction:** measures that contribute to poverty reduction are given high priority. The rationale is that adaptation measures should not only address climate impacts but also enhance the resilience of vulnerable communities, particularly in rural and marginalized areas.
- ▶ **High value:** projects that offer high economic and social value are prioritized. This includes initiatives that create jobs, improve livelihoods, or support sustainable development. Such activities are expected to provide broader benefits to society, including enhancing infrastructure, protecting livelihoods, and improving food security.
- ▶ **Alignment with Environmental and climate agreements:** the selected adaptation activities should align with multilateral environmental agreements (MEAs), ensuring that the country's actions contribute to international environmental goals, such as the Paris Agreement on climate change and biodiversity conservation conventions.
- ▶ **Lives and livelihood security:** activities that protect human health, food security, and essential services like water supply and sanitation are prioritized, especially in the face of natural disasters triggered by climate change.
- ▶ **Availability of resources and feasibility of implementing projects:** the country's capacity and available resources (financial, human & technical) must be considered. A more ambitious activity or project may appear beneficial but if implementation is too expensive or complex for the available resources, results may not be as anticipated.
- ▶ **Sustainability and long-term benefits:** this includes projects that enhance the adaptive capacity of communities and sectors, ensuring that the benefits of adaptation last well beyond the short term. Activities that do not require significant ongoing external support will score well against this criteria.
- ▶ **The institutional and administrative capacity to implement** the projects is another key consideration. Projects and activities that can be carried out effectively by existing government agencies will score highly under this criteria. Additionally, projects that strengthen local and national governance structures for climate change adaptation, such as enhancing the capacity of disaster management committees or improving technical knowledge, are prioritized.
- ▶ **Urgency of action:** measures that can provide quick relief and mitigate imminent risks, like improving early warning systems, cleaning and rehabilitating key drains or flood protection, are critical.

3.1.5. Weighting and scoring of MCA

A weighting is allocated to each of the Evaluation Criteria, and remains constant for application to all adaption measures. The weightings applied here are a first draft, and will be amended following the sectoral validation meetings to be held in May 2025. Weightings are given a value between 0-1.0, and scores between 0-10. Justification for weightings applied are provided below;

Table 6: Evaluation criteria and weighting and scoring

Evaluation criteria	Weighting (0–1.0.)	Reasoning for weighting
Severity of climate change impacts	0.4	Severity of future climate impacts in different geographical areas is unknown so difficult to plan for and prioritize over
Poverty reduction	0.6	Important, but there are also many efforts outside of climate change adaption aimed at poverty reduction.
High value	0.7	Projects that offer economic & social benefit are more likely to succeed
Alignment with Environmental and climate agreements	0.8	Important to align with MEA's and national plans, guidelines and regulations as part of ongoing cohesive efforts to address CC.
Lives and livelihood security	0.8	Health, food security, water & sanitation are key. These are the results seen by the population.
Availability of resources and feasibility of implementing projects	1.0	All projects and activities must be feasible and implementable. Activities that are too ambitious need to be screened out.
Sustainability and long-term benefits	1.0	A critical criteria
The institutional and administrative capacity to implement the projects	0.6	Important that capacity continues to grow, but recognizing that external assistance will continue to be available.
Urgency of action	0.2	Difficult to assess which activities can be or need to be implemented urgently as compared to a normal project timeline.

Scoring, between 1-10, has been appointed from the Lao context, not a general or global context. For example, if the adaption measure is a complex and ambitious measure that is only now being tried in wealthy countries, and with limited or unknown success, it has typically been scored low under the relevant Criteria.

Scoring is subjective, particularly as adaption measures are loosely defined at this stage, and are descriptive rather than defined numerically (eg. Number of people/1000 at risk from flooding). When the weighting and scoring of any MCA is workshopped in groups, it is inevitable that each group will conclude

different results. In this light, the MCA should be used as a tool for discussion and awareness of the many potential adaption measures and as a first draft for prioritisation. The final decision on which of the measures prioritized using the MCA go forward for implementation should be undertaken by experts and decision makers from each Sector.

As there are over 360 potential adaption measures compiled, it is suggested that after a screening is carried out using the MCA tool, the highest scoring 30 measures from each Sector are considered further. Some of the collated potential adaption measures will score low if they are not relevant to the Lao context, are defined at too low a level to be assessed objectively, or are not judged to be feasible or sustainable. Similarly, some measures listed in the source documents that we have judged to be more of a general measure to improve sector governance, as opposed to a climate adaption measure, have been scored low under most criteria. These will drop out in the initial screening of the 360+ adaption measures.

The initial screening of all 360+ measures has been completed and is in Appendix 6. The highest ranking 30 adaption activities per sector have been prioritized by the MCA analysis as shown in the Tables below, and will be evaluated and confirmed alongside stakeholders during the Sectorial Validation meetings scheduled for May 2025.

The cost group indicated in the table below is a methodological approach developed by the consultant to meet the financial estimation requirement set out in the Terms of Reference for each proposed action. Since the actions have not yet been discussed or validated by stakeholders, the consultant proposes to categorize them into three cost levels based on prior experience. The details of these categories and the approach are provided in Section 3.2.

Table 7: Water Resources Priority Adaptation Measures

Priority	Adaption Measure	Cost Group
1	Build basic infrastructure and develop community water supply to cope with floods and droughts	3
3	Encourage the use of energy-efficient appliances, industrial processes, and building designs to reduce overall energy consumption and thus needing less energy from hydropower.	1
4	Improved regulation of groundwater extraction in the Mekong River Basin	2
5	Create and improve legislation and plans on groundwater management and protection, including the implementation of such legislation and plans	1
6	Implement the adaptation measures against natural disasters to ensure the quality of water resources in the face of floods and droughts, such as investing in water treatment facilities and sewage networks.	3
7	Build small, medium and large-scale community water supply systems in drought-prone and water-scarce areas in both urban and rural areas to be able to provide water during the dry season	3
8	Improved groundwater access to families not on piped system	3
9	Create and implement an investment plan for water supply infrastructure.	2

10	Survey, collect data and assess water shortages and suitable areas for building water supply infrastructure.	2
11	Encourage reforestation and afforestation projects to increase vegetation cover, which helps to hold soil in place and improve water infiltration (EbA).	1
12	Invest in building and modernising reservoirs, rainwater harvesting systems, and groundwater recharge facilities to increase water availability during dry periods.	3
13	Adjust dams and reservoir operations to cope with future hydroclimatic scenarios, such as modifying water release schedules and storage capacities to ensure a fair share of the resources across sectors and communities.	3
14	Implement wetland restoration projects to rehabilitate degraded wetlands and enhance their ecosystem services such as flood control, water purification, and habitat provision (EbA).	3
15	Restore urban wetland and stream ecosystems to regulate water flow and reduce flood risk in towns (EbA).	3
16	Identify water and water resources protection zones.	1
17	Protect the water areas, high-value wetlands and peatlands by creating legislation on the management of wetlands and peatlands.	1
18	Dedicate funding to repairs & maintenance or irrigation infrastructure. Reinstate abandoned repair schemes	2
19	Construction is currently allowed in flood plains. Plans need to be carefully regulated to ensure that development does not occur in these vulnerable areas. Implementing stricter land-use policies and promoting development in safer areas will help safeguard both people and property from the dangers associated with building in flood-prone regions.	2
20	Improving and utilising the Integrated Water Resource Management framework	1
21	Strengthen and implement the Integrated Water Resource Management (IWRM) framework.	1
22	Identify areas at climate risk for groundwater quantity.	2
23	Create and implement an integrated water resources management plan to adapt and be resilient to climate change by managing and protecting water catchments, water sources, water gathering areas, ponds, water reservoirs, water area soils, aquatic biodiversity, ecosystem services, water quantity, ensuring supply and access to water sources for all sectors and communities, and women group.	2
24	Assess the risk of floods and droughts in the lower part of the river basin.	2
25	Ensure water flows from dams is sufficient to support ecosystems and livelihoods downstream.	1
26	Public access to river for irrigation	1
27	River pollution control	3

28	Provide training in integrated water resource management and climate change.	1
29	Provide training on determining the boundaries of areas that are at risk of water related disasters such as floods, droughts, soil erosion.	1
30	Provide training on determining the boundaries of areas that are at risk of water related disasters such as floods, droughts, soil erosion.	1

Table 8: Urban Development and Transport Priority Adaption Measures

Priority	Adaption Measure	Cost Group
1	Establishment and action on urban drainage Masterplans for all main cities & towns.	2
2	Improvement in enforcing the existing Decree on public burning of waste in cities	2
3	Development of basic housing and building standards to improve resilience against flooding	2
4	Create building management regulations (Building Code) and improve waste management regulations.	1
5	Improvement of action on enforcing existing Decree & regulation on public littering (litter blocks drains)	1
6	Study and develop standards and techniques for the construction, and maintenance of infrastructure related to the integration of standards for ensuring and resilient to climate change.	2
7	Assess the impact of climate change on the sector of public infrastructure and transportation, as well as build organizational and personnel capacity to develop and manage infrastructure to be resilient and able to adapt to climate change.	1
8	Develop and implement regulations, standards and plans for adaptation and investment in the field of public infrastructure and transportation.	1
9	Develop manuals on technical standards for managing the construction and repair of public works and transport infrastructure to cope with climate change.	1
10	Integrate climate change adaptation into the strategy and action plan including through results-based management framework as well as the activities and functions of programs and projects for the construction and upgrading of infrastructure proactively and concretely.	1
11	Compacted earth roads for rural villages	3
12	Invest in low-carbon public transport, such as electric buses and trains as well as in renewable energy sources and energy-efficient technologies as it helped reduce the dependency and enhance transport resilience.	3
13	Improved design of riverbank raw water intakes for urban water supplies (against flood conditions)	2

14	Encourage and promote the implementation of the Urban Environment Improvement Investment Projects in the municipalities of the provinces and Vientiane Capital.	3
15	Promote and support public transport such as electric buses as it can lower traffic and pollution in cities, positively affecting the incidence of respiratory diseases.	3
16	Study and collect data on drainage ditches within the city that are prone to floods during the rainy season in areas across the country.	2
17	Raising road & bridge levels during design stage	2
18	Improvement of regulation on roadside drainage to be correctly designed & constructed on all new road projects	1
19	Improve and build urban drainage systems and prevent floods in cities, along with the protection of protected areas, lakes, riverbanks, and wetlands to ensure that cities have good ecosystems and resilience to climate change.	3
20	Develop urban drainage planning and management standards for maintaining the environment in the construction and renovation areas.	1
21	Build strength, create, implement, monitor and report on the implementation of climate change adaptation and resilience plans, rural development and mapping.	3
22	Study the possibility of conserving ponds, swamps, waterside areas and wetlands that is seen as necessary to maintain the ecological system of the city.	2
23	Improve and manage of areas that are vulnerable to natural disasters in urban areas.	1
24	Conduct awareness raising activities about climate risks and involving communities in resilience-building efforts to improve the overall effectiveness of adaptation strategies.	2
25	Legislation and improved regulation of river sand mining	1
26	Use technical standards and technologies that are suitable for the country's environmental and geographical conditions.	1
27	Assess the risks and impacts of climate change and disasters in the field of rural development and human settlement, including education, planning, relocation of people at high risk and severely affected by climate change and disasters in an appropriate and sustainable manner.	1
28	Limit of heavy vehicles on national and provincial roads during wet season	1
29	Integrate building resilience to climate change into the activities and tasks of plans and projects to build and upgrade urban infrastructure in a timely and efficient manner.	2
30	Diversify the sources of funds from government, development partners and financial institutions to enable a climate resilience policy in line with sector and national policy.	2

Table 9: Forestry and Agriculture Priority Adaption Measures

Priority	Adaption Measure	Cost Group
1	Study and adopt drought-resilient rice varieties.	1
2	Urban development plans must avoid building in areas at risks of riverine floods and landslides. Enforcement of plans need to include restriction of unplanned settlement.	1
3	Regarding land use and planning, strengthen regulations on land leases and concessions to prevent deforestation and land degradation, and increase land and forest restoration efforts.	1
4	Promote agroecological practices to improve soil management, limit the use of chemicals, enhance food safety, target niche markets, and support climate-resilient farming techniques. For example: Agroforestry, perennial pasture phases and perennial grains can all reduce soil erosion and nutrient leaching. In upland farming. Agroforestry should be promoted with contour planting of suitable tree species for production of fruits, timber, fuelwood and non-timber forest products. These can be considered examples of Ecosystem-based Adaptation (EbA).	2
5	Promote reforestation in areas exposed to high-risks of floods, storms, landslides, and others.	2
6	Apply sustainable forest and land management in the planning process to ensure local adaptation as well as national mitigation.	1
7	Policing and Provincial level control of seasonal burning	2
8	Diversifying farming systems can enhance food security during climate shocks affecting specific crops.	2
9	Integrate indigenous knowledge into adaptation planning.	1
10	Address landslide resilience in land management plans, ensuring that construction, mining, and agriculture do not destabilise slopes. To this end, EbA actions are crucial, such as maintaining a dense and biodiverse tree cover because it protects against soil erosion.	1
11	Develop land management plans that increase resilience to landslides by ensuring road construction, mining, and agricultural activities do not destabilise slopes.	1
12	Expand and strengthen extension services. Areas of intervention: safe and effective pest and weeds management (pesticides, herbicides, biological control), sustainable use of water, knowledge of climate-resistant varieties, climate change awareness. Farmer field schools in Savannaketh were perceived as highly useful.	2
13	Support diversification in farming systems (diverse crops grown, mixed crop-livestock) which strengthens resilience to market and climate shocks. Public and private investment in further research and extension is needed to develop and scale context-specific crop-livestock integration practices.	2

14	Consider ending the promotion of unsustainable monocultures and promote crop diversification to enhance income resilience and ecosystem health.	2
15	Mainstream climate change adaptation in forestry and land-using planning strategy and action plan including through results-based management framework.	1
16	Establish climate-resilient seed banks at community levels.	2
17	Identify and design location specific irrigation schemes and technologies to reduce risks such as using solar energy, self flowing water using surface water and underground water.	3
18	Provide awareness raising to farmers on the economic risks related to contract farming and land leasing.	1
19	Organize awareness-raising activities for local communities at risk of disasters to increase understanding of risks, allowing them to cope with climate-related disasters.	1
20	Provide trainings to farmers in tree pest and disease management practices, both with natural methods and on the correct use of pesticides.	1
21	Expand capacity building to farmers, including animal health management training and food safety awareness in hot conditions.	2
22	Integrate management, prevention and control of climate change adaptation plan into the agriculture development plan at all levels within the agricultural sector. The integration includes revising agricultural laws, decrees and other policies related to agricultural sector and other relevant stakeholders.	2
23	Geographically detailed study of future climate suitability for key crops and different varieties (rice, maize, bananas, coffee, tea) to identify geographical areas for development.	2
24	Promote use of integrated agriculture production and sustainable land management (SLM) practices in order to reduce shifting cultivation and land degradation. Some good examples include coffee cultivation under the cover of big tree, integrated rice-fish system, intercropping cassava and peanuts for soil improvement, forage production for livestock management, broom grass cultivation to prevent soil erosion on sloping areas, broom grass cultivation in land degradation, intercropping system, etc.	2
25	Consider expansion of maize production for domestic consumption, as it is drought and heat resilient.	1
26	Implement or strengthen community-based seed (CBS) systems to improve access to high-quality seeds.	2
27	Identify varieties of existing or new crops that are more suitable for future hotter and variable rainfall patterns to maintain or increase productivity. This can include crops like maize, cassava, and local varieties such as Kuay Nam bananas.	2
28	Develop and update climate risk and vulnerability maps for the forestry and land-use planning sector to support the integration of climate change adaptation into the Participatory Land Use Planning and Forestry Development Plans at all levels.	2
29	Build capacity of technical staff to be able to lead, guide farmers and entrepreneurs effectively on livestock and aquatic animal production.	2

30	Enhance the capacity of relevant staff in response and management the spread of animal disease during floods and droughts.	1
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3.2 Costing Approach for Adaptation Measures

There is a need to provide cost estimates for the implementation of each of the 30-per-Sector prioritized Adaption Measures. At this stage, with the Adaption Measures being undeveloped initial descriptions and not scoped and defined subprojects, it is not possible to put a calculated cost estimate based on time and materials against each measure. We can however classify the Adaption Measure subprojects into likely cost categories based on experience. This classification offers an initial insight into the likely implementation costs and also helps highlight the level of expertise and complexity associated with each measure.

The 3 proposed costing groups are detailed as follows :

Costing Group 1: Smaller scale and shorter term community or Provincial based project without significant construction or requirement for external assistance. Budget up to US\$0.25 million.

Costing Group 2: Medium scale project that may include consultant services, some construction, and of a longer duration up to 1-2 years. Budget up to US\$1 million.

Costing Group 3: Larger, longer term project including either construction or significant Provincial or National staff involvement, regulatory and institutional development or widespread dissemination of information. This group has been applied to those Adaption Measures that are very general and do not indicate whether the activity is localized, Provincial or National. Budget between US\$1-5 million.

The prioritized 30 Adaption Measures have been allocated into these cost estimation groups for the purposes of initial consideration. Once subprojects associated with each Adaption Measure are scoped and developed further, a more accurate cost estimate can be produced. The initial cost group allocation is shown on the preceding Tables for each of the 3 sectors.

4 Research Framework and Data Collection

Data collection is a foundational component of the CRVA process, supporting not only the vulnerability and risk assessments but also the prioritization of adaptation options, and the development of sectoral adaptation guidelines and Sectoral Adaptation Plans (SAPs). A robust and iterative data collection strategy has been designed to align with the project's key deliverables, integrating both qualitative and quantitative sources and building on efforts initiated during the inception phase.

The data collection strategy is organized around four interrelated streams:

- **Desk Review of Secondary Data and Literature:** This includes a comprehensive review of climate projections, historical hazard data, socio-economic indicators, national and sectoral risk and vulnerability assessments, and relevant legal and policy documents. International frameworks, such as the IPCC reports and other global adaptation strategies, along with regional and national guidelines, including those addressing Gender Equality and Social Inclusion (GESI), are also analyzed. A preliminary list of key sectoral policies and frameworks has already been reviewed under the inception phase (see Section 4), and a broader set of complementary policies, regulations, and strategic documents will be assessed in Activity 2. This desk review aims to:
 - ▶ Collect and organize baseline data for the CRVA,
 - ▶ Identify relevant adaptation measures aligned with Lao PDR's national priorities and conditions,
 - ▶ Highlight replicable regional and international best practices,
 - ▶ Identify regulatory gaps in current climate adaptation frameworks, and
 - ▶ Provide foundational information for stakeholder engagement.
- **Use of primary data:** Through risk mapping allowed thanks to our internal software (satellite imagery). Primary data will be also valued thanks to the presence of local experts on the field, alongside with the organisation of Focus Group Discussions.
- **Sectoral Document Analysis:** Sector-specific strategies, action plans, technical reports, and project documentation have been reviewed to understand institutional roles, current adaptation actions, and ongoing challenges. This review supports the construction of the long list of adaptation measures (see Section 3), helps identify data gaps, and feeds into the gap analysis of legislative and strategic frameworks presented in Section 6.
- **Stakeholder Consultations and Focus Group Discussions (FGDs):** Targeted FGDs and consultations will be conducted with technical representatives from key ministries and agencies overseeing agriculture and forestry, urban development and transport, and water resources. These participatory discussions will serve to validate initial findings from the desk review, explore institutional capacities, clarify data gaps, and collect insights into sector-specific vulnerabilities, adaptation priorities, and social considerations. Findings from these discussions will be used to refine the CRVA and inform the adaptation planning process. To support the participatory data collection process, the Focus Group Discussion (FGD) guidelines and interview questionnaires are provided in **Annex 3: FGDs Guidelines**.
- **Hazard and Climate Data Collection:** Historical climate data, projections, and hazard event records from national and regional sources are compiled to inform risk mapping and hazard screening. Notably, six provincial CRVAs developed under the NAP-UNEP project (covering one-third of Lao PDR's provinces) will be analyzed and integrated. These assessments—summarized in the official document *“Lao PDR Provincial Storyline-based Climate Risk, Vulnerability and Adaptation Assessment (January 2025)”*—align with the National Adaptation Plan (NAP), are

endorsed by the Prime Minister's Office, and provide sectoral inputs essential to the current CRVA. The consulting team will also leverage datasets and findings from partner institutions involved in the NAP-UNEP process, including WSP, the Walker Institute, and the Climate Change Risk Management (CCRM) team.

All data collected is being tracked and organized in **Annex 2: Detailed Data Collection Table**, which specifies the source, format, relevance to project deliverables, and identifies outstanding data needs to be addressed through future stakeholder engagement or document requests.

In line with project commitments to equity and inclusiveness, a dedicated GEDSI review (see Section 5.2) ensures that gender and social inclusion considerations are integrated across all project components.

The data collection process is iterative and adaptive. As new data becomes available through FGDs or stakeholder engagements, the research framework will be refined to reflect evolving priorities and sector-specific insights. This will ensure that the final guidelines and plans are not only evidence-based but also context-specific and actionable.

5 Desk Review of International and National Guidelines and Regional and International Best Practices on Climate Adaptation

5.1 Policy and Practice Landscape: Climate Adaptation and GEDSI in Global, National, and Regional Contexts

This section serves as a crucial reference point to ensure that the analytical framework, recommendations and in order to draw sectoral adaptation plans (SAPs) that align with globally and nationally recognized standards, obligations, and priorities.

- A review of key international and national frameworks on climate adaptation and on gender equality and social inclusion (GEDSI),
- A review of the best regional practices and policy and technical innovation related to climate adaptation.

The international framework analysis draws on core documents with a specific focus on adaptation-related targets. At the national level, the review focuses on Lao key strategic instruments and sectoral policies and roadmaps relevant to climate resilience. This comparative framework aims to facilitate the identification of critical alignment opportunities and gaps between global ambitions, national strategies, and current implementation at the sectoral level.

Given the project's commitment to inclusive climate action, the review also integrates a GESI lens, examining how international and national adaptation policies incorporate considerations of gender vulnerability, intersectionality, and the specific needs of marginalized groups. This will help inform the development of equitable adaptation strategies, particularly in the prioritization of adaptation measures, the structuring of sectoral guidelines, and the engagement of stakeholders during FGDs and future planning processes.

In parallel, this section presents a curated overview of the best regional practices from ASEAN countries, focused on the three sectors of (1) Agriculture and Forestry, (2) Urban Development and Transport, and (3) Water Resources Management. The review is structured around two complementary dimensions: (1) policy innovations that have enabled institutional or governance shifts in climate adaptation at the sectoral level, and (2) technical innovations that illustrate contextually relevant solutions to reduce vulnerability and enhance adaptive capacity. These best practices have been selected based on their demonstrated impact, relevance to the Lao context, and potential for transferability. They aim to provide a comparative framework to identify opportunities for sectoral adaptation guidelines and plans.

Altogether, this combined review of frameworks and practices offers a comprehensive baseline for developing the Sectoral Adaptation Guidelines and directly supports the gap analysis by highlighting institutional, regulatory, and technical elements currently underdeveloped in Lao PDR.

5.2 International and National Frameworks for Climate Adaptation and GEDSI Review

Framework	Key Objectives & Scope	Relevance to Sectoral Adaptation in Lao PDR
Climate Adaptation		
Paris Agreement on Climate Change	The Paris Agreement aims to strengthen the global response to the threat of climate change. Its key objectives are as follows: - Keep the global average temperature rise well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change. - Increase the ability to adapt to the adverse effects of climate change and promote climate resilience and low greenhouse gas emissions development in a manner that does not threaten food security. - Make finance flows consistent with a pathway toward low greenhouse gas emissions and climate-resilient development. The key components of the Paris Agreement include: - Nationally determined contributions (NDCs): All Parties must undertake and communicate ambitious efforts as nationally determined contributions. These efforts represent a progression over time and reflect the highest possible ambition of each Party, taking into account their common but differentiated responsibilities and respective capabilities, in light of different national circumstances. Each Party must communicate a NDC every five years. - Global goal on adaptation: The Agreement establishes a global goal on adaptation to enhance adaptive capacity, strengthen resilience, and reduce vulnerability to climate change. - Financing, technology transfer, and capacity building: Developed country Parties shall provide financial resources to	The Paris Agreement on Climate Change, is relevant to sectoral adaptation to climate change in Lao PDR in several respects, particularly for the agriculture and forestry, urban development and transport, and water resources sectors. For the agriculture and forestry sector: - The Agreement recognizes the need for an effective and progressive response to the urgent threat of climate change based on the best available scientific knowledge. This underscores the importance of taking action for adaptation in vulnerable sectors such as agriculture and forestry. - Article 2 states that the Agreement aims to increase the ability to adapt to the adverse effects of climate change and promote climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production. This is directly relevant to agriculture in Lao PDR, where food security is a priority. - The preamble recognizes the fundamental priority of safeguarding food security and ending hunger, as well as the particular vulnerabilities of food production systems to the adverse effects of climate change. This justifies the focus on adaptation in the agricultural sector. - Article 5 encourages Parties to take measures to conserve and enhance, as appropriate, greenhouse gas sinks and reservoirs, including forests. This highlights the importance of sustainable forest management in the context of climate change, with implications for adaptation and mitigation in Lao PDR. - Article 7 establishes the global goal on adaptation to enhance adaptive capacity, strengthen resilience, and reduce vulnerability to climate change, with a view to contributing to sustainable development and ensuring an adequate adaptation response in the context of the temperature goal referred to in

Framework	Key Objectives & Scope	Relevance to Sectoral Adaptation in Lao PDR
	assist developing country Parties in relation to mitigation and adaptation. The Agreement also recognizes the importance of technology development and transfer, as well as capacity building in developing countries. - Enhanced transparency framework: An enhanced transparency framework for action and support is established to strengthen mutual trust and promote effective implementation. This framework provides for the regular provision of information by each Party, including a national inventory of greenhouse gas emissions and information necessary to track progress in the implementation and achievement of its NDC. - The global stocktake: The Conference of the Parties serving as the meeting of the Parties to the Paris Agreement will periodically conduct a stocktake of the implementation of the Agreement to assess the collective progress made in achieving its objective and long-term goals (referred to as the “global stocktake”). The first global stocktake will take place in 2023. - The mechanism to facilitate implementation and promote compliance with the provisions of the Agreement: An expert-based, facilitative mechanism is established. The scope of the Paris Agreement is global and applies to the Parties to the Agreement, which are also Parties to the United Nations Framework Convention on Climate Change (UNFCCC). The Agreement aims to: - Improve the implementation of the Convention, including its objective.	Article 2. This is fundamental to guiding adaptation efforts in the agriculture and forestry sector in Lao PDR. - Article 7 recognizes that adaptation efforts should follow a country-driven, gender-responsive, participatory and fully transparent approach, taking into account vulnerable groups, communities and ecosystems, and drawing on the best available scientific knowledge and, where appropriate, traditional and local knowledge. This is crucial for effective adaptation in the specific context of Lao PDR. - Article 7 encourages enhanced cooperation on adaptation, including the sharing of information, best practices, experiences, and lessons learned on science, planning, policies, and implementation of adaptation actions. This could facilitate learning and the adoption of effective adaptation strategies for agriculture and forestry in Lao PDR. - Article 7 also encourages assistance to developing country Parties in identifying effective adaptation practices, adaptation needs, priorities, and support provided and received, which is directly relevant to Lao PDR. - Article 7 mentions that each Party shall, as appropriate, engage in adaptation planning processes and implementation of actions, including the development or improvement of relevant plans, policies, and/or contributions, which may include specific strategies for agriculture and forestry. - Article 9 stipulates that developed country Parties shall provide financial resources to assist developing country Parties in both mitigation and adaptation, which could support adaptation projects in the agriculture and forestry sector in Lao PDR. - Articles 10 and 11 recognize the importance of technology development and transfer and capacity building for adaptation, which are essential for the implementation of effective adaptation measures in the agriculture and forestry sector in Lao PDR.

Framework	Key Objectives & Scope	Relevance to Sectoral Adaptation in Lao PDR
	▪ Apply to all Parties, while recognizing their common but differentiated responsibilities and respective capabilities, in light of different national circumstances. ▪ Cover mitigation, adaptation, and means of implementation and support. ▪ Take into account the specific needs and special circumstances of developing country Parties, particularly those that are particularly vulnerable to the adverse effects of climate change. ▪ Take into consideration the imperatives of a just transition of the workforce and the creation of decent and quality jobs. ▪ Recognize the importance of conserving and enhancing greenhouse gas sinks and reservoirs. ▪ Note the importance of ensuring the integrity of all ecosystems and the protection of biodiversity.	For the urban development and transport sector: ▪ Article 2 aims to increase the capacity to adapt to the adverse effects of climate change and promote climate-resilient development, which is relevant to urban planning and development and transport infrastructure in Lao PDR. ▪ Article 7 establishes the global goal for adaptation of strengthening resilience to climate change, which is essential for urban and transport systems exposed to climate impacts such as flooding or extreme weather events. ▪ Article 7 encourages the consideration of vulnerable people, places and ecosystems when assessing the impacts of climate change and formulating priority actions [37c], which potentially includes vulnerable urban populations and critical transport infrastructure. ▪ Article 7 mentions strengthening the resilience of socio-economic systems, including through economic diversification [38e], which may be relevant for urban development. ▪ The provisions on financial support (Article 9), technology transfer (Article 10) and capacity building (Article 11) are also crucial to enable Lao PDR to implement adaptation measures in the urban development and transport sector, such as the construction of climate-resilient infrastructure. For the water resources sector: ▪ Article 2 aims to increase the capacity to adapt to the adverse effects of climate change, which includes impacts on water availability and quality in Lao PDR. ▪ Article 7 sets the global goal for adaptation to enhance adaptive capacity and reduce vulnerability to climate change, which is directly relevant to water resource management in the face of climate change. ▪ Article 7 encourages the strengthening of scientific knowledge on climate, including research, systematic observation of the climate system, and early warning systems, to inform climate

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		services and support decision-making [35c]. This information is essential for adaptive water resource management in Lao PDR. ▪ Article 7 mentions the importance of assessing impacts and vulnerability to climate change [37c], which is a crucial step in identifying water-related risks and planning appropriate adaptation measures. ▪ Article 7 encourages the sustainable management of natural resources [38e] as a means of strengthening the resilience of socio-economic and ecological systems, which is directly applicable to water resource management in Lao PDR. ▪ The mechanisms for financial support (Article 9), technology transfer (Article 10) and capacity building (Article 11) can support the Lao PDR's efforts to develop and implement adaptation strategies in the water resources sector, such as integrated water resources management or the construction of resilient water infrastructure.
The first Biennial Update Report of the Lao PDR - 2020	The first biennial update report of the Lao People's Democratic Republic (Lao PDR) has been prepared in accordance with COP 17 decision and guidelines, and through consultations at the national and local levels. The key objectives of this first BUR are as follows: ▪ To provide updated information on the national situation, the greenhouse gas inventory, mitigation measures and their effects, monitoring, reporting and verification (MRV), constraints, gaps and support needs for more effective and sustainable implementation of climate change actions. ▪ In particular, highlight the implementation of climate change mitigation priorities that have co-benefits for adaptation, green growth, and sustainable socio-economic and sectoral development. ▪ Fulfill a commitment made under the UNFCCC. The key components of this first BUR include information on:	The first biennial updated report of the Lao PRD, although focused primarily on greenhouse gas inventory and mitigation actions, is highly relevant to sectoral adaptation to climate change in Laos, particularly in the agriculture and forestry, urban development and transport, and water resources sectors. For the agriculture and forestry sector: ▪ The BUR highlights the vulnerability of the Lao PDR to climate change, emphasizing that its effects affect all segments of society. It specifies that the Lao PDR is particularly vulnerable and that the impacts of floods and droughts are likely to continue and even intensify. This establishes the need for adaptation in climate-sensitive sectors. ▪ The report describes the national circumstances, including the country's socio-economic dependence on natural resources and the importance of agriculture and forestry. Approximately 80% of the population depends on agriculture, livestock and

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	▪ National circumstances. ▪ The greenhouse gas (GHG) inventory. This inventory covers four sectors: energy, industrial processes and product use (IPPU), agriculture, forestry and other land use (AFOLU), and waste, with a reference year of 2014. The estimated greenhouse gases were CO₂, CH₄, and N₂O. ▪ Mitigation actions and their effects. The report presents the main mitigation measures and targets set in national policies and strategies. ▪ Monitoring, reporting, and verification (MRV) at the national level. The report provides information on the national MRV system, which is at the planning stage and builds on existing national processes and arrangements. ▪ Constraints, gaps, and support needs for more effective and sustainable implementation of climate change actions. The report identifies financial, technical, political, legal, regulatory, institutional, and capacity constraints. It also addresses financial and technical support received and future needs for the implementation of mitigation programs. ▪ In an annex, the reference emission level and information on activities and plans for Reducing Emissions from Deforestation and Forest Degradation (REDD+) for results-based payments. The scope of the first BUR for the Lao PDR mainly covers the situation in 2014 for the GHG inventory. It reviews mitigation policies, strategies, and actions implemented up to 2020, the date of publication of the report. Geographically, it focuses on the territory of the Lao PDR. The report covers the main GHG emitting sectors and those that are essential for climate change mitigation and adaptation in the Lao PDR.	non-timber forest products (NTFPs), making them particularly vulnerable to climate hazards. ▪ The BUR provides an overview of the state of forest resources, including changes in forest cover and drivers of deforestation. Understanding these dynamics is essential for planning adaptation measures to strengthen the resilience of forest ecosystems and the livelihoods that depend on them. ▪ Although the main focus is on mitigation, the report mentions the integration of climate action and disaster risk management into the National Socioeconomic Development Plan and sectoral development plans, including agriculture and forestry. This suggests recognition of the importance of adaptation in these sectors. ▪ The BUR identifies constraints, gaps, and support needs, which may include aspects relevant to adaptation, such as financial and technical barriers to the adoption of sustainable and climate-resilient agricultural and forestry practices. ▪ The report refers to the Climate Change Action Plan (2013), which included adaptation actions and measures in agriculture, land use, and forestry. For the urban development and transport sector: ▪ The BUR addresses the state of the environment, noting that rapid development and population growth, including migration from rural areas to cities, are leading to increased environmental impacts and a lack of green infrastructure. This information highlights urban vulnerabilities to climate change, such as urban heat islands and waste and wastewater management in the context of climate stress. ▪ The report mentions the integration of climate action and disaster risk management into sectoral development plans, including the public works and transport sector. ▪ Although focused on mitigation, discussions on promoting low-emission transport and improving public transport systems can have co-benefits for adaptation, contributing to more liveable

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		cities that are less dependent on fossil fuels in the event of climate-related disruptions. ▪ The constraints identified, such as the lack of clear policies for the promotion and transfer of environmentally friendly and low-carbon technologies, are also relevant for the adaptation of urban and transport infrastructure. For the water resources sector: ▪ The BUR describes the abundance of freshwater resources in the Lao PDR and its location in the Mekong River basin, highlighting the vital importance of this resource and its susceptibility to climate-induced changes in hydrological patterns. ▪ The report highlights the significant socio-economic impact of past floods and droughts, demonstrating the country's vulnerability to extreme hydrological events exacerbated by climate change. ▪ The Climate Change Action Plan (2013) mentioned in the BUR included adaptation measures in the area of water resources. ▪ Although not specifically focused on water resource adaptation, information on financial and technical support needs could be relevant to projects aimed at strengthening integrated water resource management in the face of climate change. In summary, although the first BUR for Lao PDR focuses mainly on mitigation, it provides an essential national context, highlights sectoral vulnerabilities, recognizes the need to integrate climate action into development plans, identifies relevant constraints and needs, and mentions existing or planned adaptation initiatives. This information provides an important basis for understanding the challenges and priorities for sectoral adaptation to climate change in Lao PDR.

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Lao PDR National Green Growth Strategy 2030	The National Green Growth Strategy 2030 of the Lao PDR has the following key objectives and components, based on the sources provided: Key Objectives: ▪ Translate the Resolution of the 10th Party Congress, Vision 2030, the Ten-Year Strategy (2016-2025) and the 8th National Socio-Economic Development Plan (2016-2020) into detail to ensure the achievement of medium- and long-term socio-economic development goals. These objectives include graduating from least developed country (LDC) status by 2020, becoming an upper middle-income developing country, and achieving the Sustainable Development Goals (SDGs) by 2030 in a green and sustainable manner. ▪ Contribute to promoting the country's economic growth, improving the standard of living of the population, and creating jobs and income-generating activities. ▪ To actively contribute to rural development, poverty reduction, and the reduction of development disparities between urban and rural areas, between rich and poor, between women and men, and between various ethnic groups. The goal is to enable all ethnic groups and social strata to participate in and benefit from socio-economic development in a comprehensive, inclusive, and equitable manner. ▪ Contribute to improving the efficiency, effectiveness, and sustainability of the use of the country's limited natural resources to ensure optimal benefits, including forest resources, land, mines, water resources, water sources, and biodiversity.	The strategy emphasizes that the Lao PDR is highly vulnerable to climate change and natural disasters due to its small economy and high dependence on nature. Climate change and natural disasters can therefore prevent the country from achieving its medium- and long-term socio-economic development goals. The strategy recognizes the importance of sectoral adaptation to climate change, particularly for vulnerable sectors such as agriculture and forestry, urban development and transport, and water resources. Agriculture and Forestry: ▪ For the agricultural sector, the strategy emphasizes increasing the efficiency and effectiveness of production by using alternative methods and techniques that are clean, efficient, sustainable, and capable of adapting to different environmental conditions throughout the Lao PDR. ▪ It encourages the reduction of waste and pollution caused by agricultural production and the shift towards integrated agricultural production to reuse waste as raw materials for organic fertilizers and biogas. ▪ The strategy promotes the development of producers' knowledge and skills to improve production techniques and efficiency, as well as the diversification of livelihoods. ▪ It supports integrated agricultural production and crop rotation practices to reduce soil degradation and long-term monoculture, considering economic efficiency, technical feasibility, climate change, and food security. ▪ An important point is the control of production, import, distribution, and use of pesticides and chemicals that are hazardous to human and animal health and to the environment in agricultural production. ▪ Improving and expanding the agricultural production infrastructure system is also highlighted to increase production

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	▪ Contribute to reducing the country's economic risks and vulnerability to natural disasters and global economic uncertainties, which have become more severe and unpredictable. ▪ Contribute to reducing or limiting the increase in pollution, dirt, waste, and greenhouse gas emissions, which are the main causes of climate change, natural disasters, and many diseases. Components: The strategy identifies targeted areas and sectors as well as supporting sectors. ▪ Cross-Cutting Focused Areas: ○ Environment and investment management: Improve the efficiency of the investment management system. ○ Rural development and poverty reduction: Aim for inclusive and equitable economic growth and poverty reduction. ○ Gender role: Protection and promotion of women's advancement: Focus on improving the role and advancement of women. ○ Climate change adaptation and natural disaster management: Reduce risks and vulnerabilities in the economy. ▪ Focused Sectors: ○ Natural resources and environment: Ensure optimal use of natural resources and protection of the environment. ○ Agriculture and forestry: Promote clean production and sustainable forest management.	efficiency and water resource management, thereby reducing risks and vulnerability to climate change and natural disasters. ▪ In the forestry sector, the strategy emphasizes the sustainable protection and use of forests, recognizing their role in environmental protection, water supply, carbon sequestration, etc. It aims to increase forest cover to 70% by 2020. ▪ It encourages the creation of mechanisms for the development and implementation of forest management, protection, and utilization plans with the participation of many sectors and local administrations. ▪ The strategy supports sustainable forest management by communities to promote the local economy and reduce poverty. ▪ It encourages investment in forest plantations using integrated and rotational methods on deforested and degraded land. ▪ Improving and restoring forest quality, particularly in water source forests, is a priority. ▪ The strategy emphasizes strengthening monitoring, prevention, and reduction of forest cover destruction, particularly by improving land concession management. Urban Development and Transportation: ▪ The strategy recognizes that climate change issues (heat waves, heavy rains, floods, droughts, etc.) affect road networks, building structures, and construction in urban areas, leading to quality degradation and shorter lifespans. ▪ For urban development, the strategy focuses on the development of urban plans, housing and building designs that make urban areas beautiful, green, with unique national artistic and cultural value, a stable structure, and resilient to climate change and natural disasters. ▪ It encourages the use of efficient and environmentally friendly building materials.

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	○ Industry and trade sector: Support environmentally friendly industrialization and modernization and promote handicrafts and trade in green products. ○ Public works and transport sector: Focus on sustainable urban development and environmentally friendly land transport. ○ Energy and mining sector: Promote clean energy and sustainable mining. ○ Information, culture and tourism sector: Use information to raise awareness of green growth and develop sustainable tourism. ○ Science and technology sector: Develop research and innovation to support green growth. ▪ Supporting sectors: ○ Financial sector: Develop fiscal and financial policies that promote green growth. ○ Banking sector: Facilitate access to finance for green growth initiatives. ○ Education and sports sector: Raise awareness and integrate green growth into education programs. ○ Labor and social welfare sector: Support the transition to a green economy and assist vulnerable populations. ○ Health sector: Improve public health, which is linked to a healthy environment. This strategy aims to integrate green growth into sectoral and local strategies and plans to ensure coherence and effective implementation of programs and projects related to sustainable growth. It also provides for the creation of a National Center and Fund for the Promotion of Green Growth to coordinate and finance activities. A monitoring and	▪ The strategy promotes the improvement of urban transport infrastructure to facilitate walking, the use of non-motorized vehicles (bicycles) and public transport services (buses). ▪ It aims to design and manage road network infrastructure so that it has a stable structure and is resilient to climate change. ▪ Awareness raising and value creation to encourage walking, the use of non-motorized vehicles, and public transport are also highlighted. ▪ The strategy encourages and supports investment in fuel-efficient and low greenhouse gas emission public transport vehicles. Water Resources: ▪ The strategy recognizes that water and water resources are important natural resources for the Lao PDR and that economic growth is linked to their efficient, effective, and sustainable management and use. ▪ It emphasizes the promotion of the efficient, effective, and sustainable management and use of water and water resources. ▪ A key point is the encouragement and promotion of the creation of a coordination mechanism for the management, allocation, and use of water with the participation of many sectors and local administrations to ensure sufficient and quality supply for public consumption, agricultural production, conservation of aquatic life, fisheries, hydropower production, and industrial uses. ▪ The strategy emphasizes the importance of protecting and improving the quality of forests and water sources linked to water reservoirs. ▪ It encourages the protection, improvement, and expansion of natural and artificial water reservoirs to ensure adequate storage and supply and to respond to climate change and water shortages.

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	evaluation system based on specific indicators is also planned to measure progress.	Water quality control and the formulation of plans for the efficient and sustainable management, allocation, and use of water resources are also priorities.
National Strategy on Climate Change of the Lao PDR (2023)	The National Climate Change Strategy of Lao PDR details the path for 2023-2030 to realize the objective to achieve the goal of net-zero greenhouse gas emissions by 2050, enhancing the ability to withstand, adapt to, and recover from the impacts of climate change. It seeks to protect lives, health, assets, the environment, and infrastructure while promoting sustainable and green socio-economic development. The strategy acknowledges the necessity to align with the nation's economic and social development plans, regional frameworks, and international agreements³. Key aspects of the strategy include: - Strengthening policies, organization, human resources, finance, coordination, research, and public awareness. - Enhancing resilience at the urban, rural, community, infrastructure, and ecosystem levels. - Reducing greenhouse gas emissions by 60% compared to business-as-usual levels. - Limiting disaster impacts on the economy to less than 0.2% of GDP and affecting fewer than 120,000 people by 2030. - Increasing forest cover to 70% of the country's area. - Achieving 30% renewable energy use in total energy consumption. The strategy recognizes Lao PDR's vulnerability to climate change despite its low greenhouse gas emissions. It addresses the need for adaptation and mitigation measures, particularly in sectors like agriculture, forestry, and water resources⁵. The National Climate Change Strategy also promotes the integration of climate change	International framework: The description of the governance documents and the international framework is also essential. Laos has ratified the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol and the Paris Agreement. Sectoral impacts: An initial description of the impacts of climate change by sector is provided. The task will be to review the information provided, identify the main impacts, and then explore it in more detail in the sectoral CRVA. Sectoral measures: Sectoral measures will be examined and developed in the sectoral action plans, as well as the obstacles identified to their implementation. Prioritization criteria are also provided and integrated. The strategy focuses on key sectors such as rural development, urbanization, energy and public health. Mitigation and adaptation: The strategy addresses both greenhouse gas mitigation and adaptation measures. Mitigation efforts aim to reduce emissions by 60% compared to business as usual, while adaptation measures aim to strengthen the resilience of infrastructure and communities.

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	considerations into various national strategies and plans, such as the National Socio-Economic Development Plan	
National Strategy on Disaster Risk Reduction (NSDRR) 2021 - 2030	The National Strategy for Disaster Risk Reduction (NSDRR) 2021-2030 of the Lao People's Democratic Republic has a vision of a Lao PDR that is strong in disaster management, capable of reducing damage and losses caused by disasters to society, the economy, and the environment, and capable of integrating DRR into National Socio-Economic Development Plans and sectoral plans for each period. The principles of the NSDRR include compliance with policies, the constitution, laws, strategies, PNSE, national defense and security, and international treaties and agreements. It covers all types of disasters, ensures equality, justice, transparency, disclosure, and accountability, and guarantees the participation of all social sectors and coordination between ministries, agencies, organizations, and local authorities. The overall objective of the NSDRR is to strengthen and develop the disaster risk management and reduction system more effectively by 2030, with the aim of enhancing prevention, control, and post-disaster recovery. The NSDRR establishes seven key strategies: ▪ Strategy 1: Develop and strengthen the disaster prevention, disaster risk reduction, preparedness, and response system. This strategy includes four specific objectives: ○ Objective 1: Disseminate and implement the Disaster Management Law and establish a disaster risk reduction system at the central and local levels, coordinate disaster management and regional and international cooperation. ○ Objective 2: Integrate DRR into development planning and implementation by incorporating DRR into	The National Disaster Risk Reduction Strategy (NDRRS) 2021-2030 is highly relevant for sectoral adaptation, particularly for the agriculture and forestry, urban development and transport, and water resources sectors. For the agriculture and forestry sector, the NDRR acknowledges that droughts have major direct impacts on agriculture and food security. The 2018 floods caused severe losses to this sector, accounting for up to 57% of total losses. The strategy aims to integrate DRR into sectoral plans, including agriculture and forestry. Target 9 seeks to clarify the roles and responsibilities of sectors in DRR and specifically mentions coordination for the prediction or occurrence of agricultural pests, plant or animal epidemics, and drought. Guidelines for intersectoral coordination on disaster risks for the agricultural sector are planned, including early warning, adaptation of agriculture to natural hazards due to climate change, and crop disease and pest management. In addition, the promotion of climate-resilient agricultural production is highlighted to improve food security and nutrition in high-risk communities. Objective 5 aims to strengthen the resilience of infrastructure, including irrigation, which is crucial for agriculture. With regard to the urban development and transport sector, the NSDRR emphasizes the construction and maintenance of more disaster-resilient infrastructure. The 2018 floods severely affected the transport sector, accounting for up to 65.5% of total damage. Target 5 aims to improve the resilience of infrastructure such as roads and bridges. A multisectoral task force on resilient infrastructure is planned to develop an intersectoral mechanism for the planning, construction, and maintenance of infrastructure that is resilient to disasters and

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	sectoral plans and National Socio-Economic Development Plans (PNSE). ○ Objective 3: Develop and progressively implement provincial DRR strategies and plans, and local DRR plans in high-risk areas, alongside the provision of capacity building and resources for implementation. ○ Objective 4: Develop capacities, undertake risk mapping and assessments, and effectively manage and share disaster risk data and information within and between ministries and agencies, while complying with international reporting requirements. ▪ Strategy 2: Strengthen disaster response and emergency assistance. This strategy includes a specific objective: ○ Target 7: Develop national capacity for rapid and effective humanitarian response to disasters to reduce immediate suffering and loss of life, as well as secondary impacts on health and well-being. ▪ Strategy 3: Develop and strengthen post-disaster recovery. This strategy includes a specific target: ○ Target 8: Ensure that the socio-economic needs of affected communities, as well as physical reconstruction, are addressed in a manner that increases future resilience, in line with the Sendai Framework's commitment to “build back better.” ▪ Strategy 4: Strengthen sectoral coordination on disaster risk reduction, emergency response, and recovery. This strategy includes a specific objective: ○ Objective 9: Clarify the roles and responsibilities of sectors in DRR, preparedness and response to	climate change. This includes revising building and construction codes where necessary. Target 2 provides for the integration of DRR into development planning, including urban planning. For the water resources sector, the NDSDR addresses risks related to droughts and floods, with the Mekong being a major source of regular flooding. The development of hydropower projects has impacts on the Mekong hydrological system, potentially increasing flood risk without appropriate water management. Goal 9 provides for coordination on early warning and emergency response for hydroelectric dam operations and accidents. It also aims to strengthen watershed and water resource management through intersectoral coordination on DRR. A review of watershed and water resource management is planned to establish a policy framework to balance short-, medium- and long-term water needs, including for hydropower generation and irrigation. The amendment to the Water and Water Resources Act of 2017 emphasizes the importance of preventing water damage and restoring affected areas. Goal 5 also includes improving the resilience of water supply and irrigation systems. In summary, the NSDRR 2021-2030 is highly relevant for sectoral adaptation by: ▪ Agriculture and forestry: integrating DRR into planning, improving drought and flood management, promoting climate-resilient agricultural practices, and ensuring intersectoral coordination for risks specific to this sector. ▪ Urban development and transport: by focusing on the construction of resilient infrastructure, including roads and bridges, and integrating DRR into urban planning and the revision of building codes.

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	different types of hazards, and recovery, in line with the Disaster Management Law and sectoral mandates. ▪ Strategy 5: Improve national and local education and training on DRR. This strategy includes a specific objective: ○ Target 10: Sustainably increase the DRR capacity of government officials and community leaders by utilizing training and education resources within the Lao PDR. ▪ Strategy 6: Promote stakeholder participation, engagement, and inclusion. This strategy includes one specific target: ○ Target 11: Develop new mechanisms for engaging non-governmental actors in DRR to support a whole-of-government approach in line with the Sendai Framework, including the private sector, in particular micro, small, and medium-sized enterprises (MSMEs), organizations that support women's socio-economic resilience, and those representing the needs of vulnerable groups. ▪ Strategy 7: Budget and financing for disaster risk. This strategy includes a specific objective: ○ Target 12: Ensure adequate state budget for regular DRR and disaster management activities within the MLSW and other relevant ministries, make funds readily available for rapid response from the central to the local level, and improve access to international support for DRR, disaster risk financing and insurance, and recovery and reconstruction after a major disaster. The NDSDR also includes implementation measures focused on multisectoral coordination and cooperation, budgeting and financial	▪ Water resources: addressing flood and drought risks, improving water resource and watershed management, and ensuring coordination for hydroelectric dam operations and safety. The Annex to the NSDRR further details the areas of focus for DRR in government planning for 2021-2030 under the 12 objectives, providing a basis for integrating DRR into sectoral development plans. Relevant ministries will be required to incorporate this strategy into their development plans, programs, and projects for implementation.

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	resource mobilization, cooperation with development partners, awareness raising and capacity building, and review, reporting and evaluation. An annex details the areas of DRR intervention for government planning from 2021 to 2030 within the framework of the 12 objectives of the NSDRR.	
Nationally Determined Contribution (NDC)	The 2020 NDC presents greenhouse gas (GHG) emission scenarios, including a baseline scenario, an unconditional mitigation scenario until 2030, and a conditional mitigation scenario until 2030 aimed at achieving net zero GHG emissions by 2050. The new NDC updates and extends the targets of the 2015 NDC, including new sectors, and formulates new national objectives for reducing emissions. The NDC covers the sectors of energy, industrial processes, agriculture, land use change and forestry, and waste. The greenhouse gases concerned are carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). The NDC focuses on adaptation to climate change in vulnerable sectors such as agriculture, forestry, water resources, transportation, urban development, public health and energy. It includes short-term adaptation goals for 2025 aimed at strengthening measurement, reporting and verification systems. Additionally, the NDC estimates the financing needs for the implementation of the conditional mitigation measures at 4.762 billion US dollars. Laos is also seeking support for the strengthening of administrative, legal, technical and institutional capacities, as well as political assistance and preparatory aid for the implementation of its NDC. Finally, the NDC describes the procedures for monitoring each mitigation measure and provides for the definition of national parameters to document progress, effectiveness and gaps in adaptation. The Ministry of Natural Resources and Environment	This document is fundamental to our work and is a necessary basis for further developing the sectoral approach. It also identifies sources that will be particularly useful to our analysis, as it has been endorsed by the government. The Climate Risk and Vulnerability Assessment (CRVA) and action plans must be aligned with this document and more specifically with the: ▪ International framework: The description of the governance documents and the international framework in this document is essential as Laos has ratified the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol and the Paris Agreement. Moreover, the NDC also refers to the regulatory and policy framework associated. ▪ The sectoral impacts assessment: An initial description of the impacts of climate change by sector is provided. The task will be to review the information provided, identify the main impacts, and then explore them in more detail in the sectoral CRVA. The strategy and adaptation measures proposed at sectoral level: the strategy addresses both greenhouse gas mitigation efforts aiming to reduce emissions by 60% compared to business as usual, and adaptation measures aiming to strengthen the resilience of infrastructure and communities. Some sectoral measures (especially for urbanization and energy) are mentioned will be examined and

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	(MONRE) is responsible for the overall measurement, reporting and verification of mitigation targets.	developed in the sectoral action plans, as well as the obstacles identified to their implementation.
9th National Social Economic Development Plan 2021-2025	The 9th Five-Year National Socio-Economic Development Plan (PNSEDP) of Laos (2021-2025) aims to translate the resolution of the 11th Party Congress and to continue the implementation of the National Socio-Economic Development Strategy for 2025 and Vision 2030. The five-year plan establishes the fundamental direction for creating a new turning point in socio-economic development in the years to come. It aims to fully develop the country's potential in the production and service sectors, in line with a green and sustainable development orientation, to improve the well-being of the population, to ensure a balanced system for international trade and settlement, and to ensure full preparation for the country's firm exit from least developed country status in the future. It delves into: ▪ The evaluation of the implementation of the 8th NSEDP (2016-2020). ▪ The long-term development goals and expected results and achievements of the 9th NSEDP and, ▪ The implementation measures and mechanisms for implementing the 9th NSEDP as well as the monitoring and evaluation criteria for it. The 9th NSEDP is structured around several strategic pillars: ▪ Exit from least developed country status: Preparations to graduate from this category, ensuring employment and improving the standard of living of the population. ▪ Resilience to challenges: Overcoming weaknesses and difficulties, particularly financial and monetary problems, and strengthening preparedness for emerging challenges such as COVID-19 and climate change.	The 9th NSEDP 2021-2025 could provide several relevant elements for your CRVA, particularly with regard to key sectors, adaptation objectives and priority projects. Here are some potential avenues to explore: ▪ Sectoral adaptation goals: The plan details adaptation goals for sector that are identified as vulnerable such as agriculture, forestry, water resources, transportation, urban development, public health and energy. For example, in agriculture, the goal is to promote the climate resilience of agricultural systems, while in forestry, it is to promote climate resilience in forest production and forest ecosystems. These goals can serve as a basis for evaluating the effectiveness of current adaptation measures and identifying gaps. ▪ Projects and mitigation measures: the NSDEP highlights some mitigation measures such as the development of policies and laws to promote the use of vehicles powered by clean or locally available energy sources, for the transportation and industrial sectors to reduce the import and use of fossil fuels and greenhouse gas emissions. ▪ Monitoring and evaluation indicators: The NSEDP includes indicators to monitor progress in various areas, including the environment and disaster risk reduction. These indicators can be used to assess the impact of climate change and the effectiveness of adaptation measures. The annex to the NSDEP contains baseline data and targets for various environment-related indicators, such as forest cover, sales of forest carbon credits and the use of clean energy in transportation. ▪ Investment priorities: The plan highlights priority areas for public and private investment, including projects related to climate

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	▪ Human resource development: Focus on the quality of human resources as an important factor in socio-economic development. ▪ Quality economic growth: Reform the economic structure in each sector and locality, using information and communication technologies (ICT) to create opportunities and stimulate the production of goods and services. The plan also emphasizes regional and international integration, taking advantage of Laos' geographical location and improving infrastructure. It highlights the importance of international cooperation and regional integration to ensure sustainable and inclusive economic growth.	change adaptation and disaster management that it would be interesting to explore. The PNSEDP information, would allow us to provide a comprehensive assessment of climate risks and vulnerabilities in the identified sector as well as recommendations for building resilience and promoting sustainable development.
Gender Equity and Social Inclusion		
Lao 4th Five-Year National Plan of Action on Gender Equality (2021-2025)	The National <i>Action Plan for Gender Equality</i> is a document that follows on from the third National Action Plan for Gender Equality (2016-2020). It aims to integrate Vision 2030, the ten-year national strategic plan for gender equality (2016-2025) and the 9th national socio-economic development plan (2021-2025). It also takes into account the National Population and Development Policy (2019-2030), the Gender Equality Act and the recommendations of the United Nations. The plan is divided into three parts and four work plans: Part I: Summary report of the third National Action Plan for Gender Equality (2016-2020) Part II: Fourth National Action Plan for Gender Equality (2021-2025) Part III: Implementation Measures and Mechanisms The four work plans are as follows: Work Plan 1: Dissemination, Awareness Raising and Development of the Database System	It is important that the CRVA integrate a gender perspective and consider gender differentiated vulnerability to climate risks and climate change. Additionally, all the sectoral recommendations provided guarantees gender rights and gender equality and should try to be aligned with the four workplan. The following output could serve as basic guidelines: ▪ Output 2.6: Reduce climate and disaster risks for women, men, girls and boys. ▪ Output 2.3: Develop a high-quality female workforce and professions, generating a stable income and ensuring dignity. Moreover, it is important that the recommendations include mechanisms for the collection of data disaggregated by sex in order to monitor progress in adapting to climate change and to assess the impact of measures on women and men.

Framework	Key Objectives & Scope	Relevance to Sectoral Adaptation in Lao PDR
	Work Plan 2: Promoting and Establishing Gender Equality Work Plan 3: Develop, review and amend policies and legislation, and implement regional and international obligations under treaties and declarations to which the Lao PDR is a party Work Plan 4: Strengthen organizational structures and personnel responsible for gender equality The action plan has two main lines of action and five objectives. It aims to improve data systems, create a database and collect statistical data on gender equality and the elimination of all forms of discrimination against women at the central, national and local levels. It aims to create a favorable environment and promote access to information on gender equality and the elimination of all forms of discrimination against women in all sectors of government, state enterprises, the private sector, development partners, civil society and the general public. It places importance on strengthening the organizational structures and personnel responsible for gender equality. The overall objective of the plan is to guarantee gender equality rights and development, including the end of all forms of violence against women in all areas, ensuring that women can participate fully in political, economic, socio-cultural and family activities.	
Gender Equality Strategy 2022-2026 – UNDP and Lao PDR	The UNDP <i>Gender Equality Strategy in Laos (2022-2026)</i> recognizes that gender equality is a fundamental human right and a necessary foundation for a peaceful, prosperous and sustainable society. The strategy outlines the country office's commitment to helping the government overcome the deep-seated structural barriers that perpetuate gender inequality and to promoting sustainable development opportunities. It offers a path to accelerate the institutional transformation of the country office in all pillars of its	It is important that the CRVA integrate a gender perspective and consider gender differentiated vulnerability to climate risks and climate change. Additionally, all the sectoral recommendations provided guarantees gender rights and gender equality and should try to be aligned with strategy and its guiding principles but also with : The identified pillars of actions: ▪ Programming: Ensure that sectoral climate adaptation projects integrate gender equality.

Framework	Key Objectives & Scope	Relevance to Sectoral Adaptation in Lao PDR
	work: (1) programming, (2) operations, (3) communications and (4) partnerships. The key elements of the strategy and action plan are as follows: ▪ Objective: To guide the institutional transformation necessary to position the UNDP Lao PDR as an organization capable of advancing gender equality and women's empowerment in Laos. ▪ Strategic frameworks: The strategy proposes five flagship solutions in the following areas: (1) poverty and inequality; (2) governance; (3) resilience; (4) environment; and (5) gender equality and women's empowerment. Building on these flagship solutions, the UNDP Lao PDR is committed to delivering results in the three interrelated pillars of inclusive prosperity, environment, climate change and resilience, and governance and the rule of law, as outlined in the CPD. ▪ Three levers: To realize the strategy, the country office will pursue and integrate three levers to not only facilitate but also accelerate and amplify the strategy's results: financing, digitalization, and strategic innovation. ▪ Three directions of change: The strategy strives to achieve radical and lasting change for gender equality that manifests itself in three directions of change: structural transformation, leaving no one behind and strengthening resilience. ▪ Three guiding principles: The strategy is based on the integration of the following three guiding principles, which have essential implications for gender equality and the empowerment of women: women and men as active agents of change, the engagement of men and boys, and accountability. ▪ Expected results and achievements: The strategy defines the following expected results and achievements: programming, operations, communications and partnerships.	▪ Operations: Promote an inclusive work environment that respects gender equality. ▪ Communications: Use communication strategies that promote gender equality and women's empowerment. ▪ Partnerships: Collaborate with various partners to promote gender equality in adaptation initiatives. And the identified directions of change: ▪ Structural transformation: Eliminate the institutional and societal barriers that hinder gender equality. ▪ Leave no one behind: Target multiple and intersecting forms of discrimination. ▪ Building resilience: Helping communities adapt to climate shocks, with a focus on gender equality.

Framework	Key Objectives & Scope	Relevance to Sectoral Adaptation in Lao PDR
	Implementation framework (action plan): The action plan details the targets, milestones, indicators and responsibilities for each expected result of the strategy. The strategy is based on the obligation for all United Nations entities to adopt a methodology for gender mainstreaming, as mandated by the Beijing Declaration and Platform for Action, the United Nations System-wide Action Plan (SWAP) on gender equality and the empowerment of women, and the United Nations System-wide Strategy on Gender Parity. It is also aligned with the common chapter of the strategic plans of the UNDP, UNFPA, UNICEF and UN Women (2018-2021), with the UNDP global strategy for gender equality (2022-2025) and promotes the application of the UNDP global social and environmental standards (SES). The strategy is organized around four outcomes and 20 outputs and presents an implementation framework (action plan) including a list of measurable indicators, baselines, targets and responsibilities. It aims to advance gender equality and opportunities for the empowerment of women through effective partnerships, capacity-building interventions and sector-wide collaboration.	
GCF Gender Policy (2019)	The GCF Gender Policy has three main objectives: - Support climate change interventions and innovations through a comprehensive gender approach, applied both within the institution and through its network of partners, including Accredited Entities (AEs), National Designated Authorities (NDAs) and focal points, as well as implementing partners for activities carried out under the GCF's Preparation and Support Program. - Promote climate investments that: - Advance gender equality through climate change mitigation and adaptation actions.	The policy recognizes from the outset that the GCF has a clear mandate to improve gender responsiveness in its processes and operations. The rationale for the Gender Policy highlights several key points regarding the relevance of GESI for sectoral adaptation: - Exacerbation of existing inequalities: The impacts of climate change can exacerbate existing gender inequalities. For example, droughts can have a disproportionate impact on women farmers who depend on water for their crops. - More sustainable and equitable solutions: Climate change initiatives are more sustainable, equitable, and more likely to achieve their objectives when gender equality and women's

Framework	Key Objectives & Scope	Relevance to Sectoral Adaptation in Lao PDR
	○ Minimize social, gender and climate risks in all climate change actions. ▪ Contribute to reducing gender disparities in social, economic and environmental vulnerabilities and exclusion exacerbated by climate change through GCF climate investments that integrate gender equality considerations. The requirements of the Gender Policy are categorized as follows: ▪ Responsibilities of the GCF. ▪ Commitments of Accredited Entities (AEs). ▪ Project-level requirements.	empowerment considerations are integrated into project design and implementation. This is true in all sectors mentioned. For example, in urban development, climate-resilient infrastructure that does not take into account women's specific needs for safety or mobility may be less effective and equitable. ▪ Women and vulnerable communities are part of the solution: They should be effectively engaged in discussions and decisions that affect them. Their knowledge and experience can provide valuable perspectives for effective adaptation solutions in their respective sectors. For example, women's traditional knowledge in agriculture can contribute to climate-resilient adaptation practices. The policy's guiding principles also emphasize the need for a gender-responsive approach to climate change adaptation. They recognize the importance of respecting, promoting, and considering the principles of gender equality and women's empowerment when taking action to combat climate change. Furthermore, the policy aligns with Article 7.5 of the Paris Agreement, which stipulates that adaptation measures must follow a country-driven, gender-responsive, participatory, and fully transparent approach. In conclusion, integrating gender and social inclusion into sectoral adaptation to climate change is crucial to ensuring the effectiveness, equity, and sustainability of interventions. It makes it possible to address the specific vulnerabilities of different groups, leverage the knowledge and capacities of all, and build stronger resilience to the impacts of climate change in agriculture and forestry, urban development and transport, and water resources sectors.

Framework	Key Objectives & Scope	Relevance to Sectoral Adaptation in Lao PDR
GCF Gender Equality and Social Inclusion Policy and Action Plan 2020-2023	The GCF Gender Policy has three main objectives: ▪ Support climate change interventions and innovations through a comprehensive gender approach, applied both within the institution and through its network of partners, including Accredited Entities (AEs), Designated National Authorities (DNAs) and focal points, and implementing partners for GCF activities under the Preparation and Decision Support Program. ▪ Promote climate investments that: ○ Advance gender equality through climate change mitigation and adaptation actions. ○ Minimize gender- and climate-related social risks while striving to promote respect for and observance of the human rights of all people, including women and men from vulnerable or marginalized communities, in all climate change-related actions. ▪ Contribute to reducing gender gaps in social, economic, and environmental vulnerabilities and exclusions exacerbated by climate change through FVC climate investments that integrate gender equality considerations.	The GCF gender policy recognizes that gender relations, roles, and responsibilities have a significant influence on women's and men's access to and control over decisions, assets, and resources, information, and knowledge. It also recognizes that the impacts of climate change can exacerbate existing gender inequalities and gender based violence. Therefore, climate change initiatives are more sustainable, equitable, and more likely to achieve their objectives when gender equality and women's empowerment considerations are integrated into project design and implementation. In the context of sectoral adaptation in Laos, this would involve: ▪ Conduct gender assessments specific to sectors vulnerable to climate change (e.g., agriculture, water resources, health) to understand how men and women are differently affected by climate impacts and what their specific capacities and needs are. ▪ Develop gender action plans at the project and sector levels that incorporate specific measures to address gender inequalities identified in the assessments. These plans should include measurable indicators and targets to monitor progress. ▪ Ensure the equitable and inclusive participation of women and men, including marginalized and vulnerable groups, in consultations and decision-making processes throughout the life cycle of sectoral adaptation projects. This is consistent with the GCF's principle of stakeholder engagement and consultation. ▪ Collect sex-disaggregated data and conduct qualitative and quantifiable gender analysis to inform the design, implementation, monitoring, and evaluation of sectoral adaptation interventions.

Framework	Key Objectives & Scope	Relevance to Sectoral Adaptation in Lao PDR
		Strengthen the capacity of national actors (including designated national authorities/focal points, accredited entities, and implementing partners) to effectively integrate gender considerations into their sectoral adaptation policies, procedures, and projects. The GCF offers preparatory support for this purpose. The general principles of the GCF's gender policy suggest that integrating a gender perspective into sectoral adaptation in Laos could lead to more effective, equitable, and sustainable interventions that take into account the distinct needs and contributions of women and men in the various sectors affected by climate change.
GGGI-UN Women Guidance Note for Gender Integration in Long-Term Low Emission Development Strategies	The objectives of the GGGI-UN Women Guidance Note on Gender Mainstreaming in Long-Term Low-Emission Development Strategies (LT-LEDS) are multiple. Primarily, it aims to present a methodology for integrating gender into LT-LEDS. This integration aims to seize the significant opportunities offered by the socio-economic transformations associated with low-carbon economic pathways to achieve gender equality and women's empowerment. The note also aims to help other countries or regions maximize gender co-benefits in their LT-LEDS processes and move toward just, inclusive, and gender-responsive green transitions. For Least Developed Countries (LDCs) such as Burkina Faso, the note aims to provide guidance on achieving sustainable development while highlighting opportunities for creating stronger and more resilient green economies. A fundamental objective is to avoid a disproportionate impact (positive and negative) of the transition on any particular group, to ensure access for all to new opportunities in the green economy, and to leverage the transition for a more equitable society and women's empowerment.	The GGGI-UN Women Guidance Note focuses primarily on gender mainstreaming in Long-Term Low-Emission Development Strategies (LT-LEDS), using the case of Burkina Faso in 2022. Although the note does not specifically mention sectoral adaptation to climate change in Laos (PDR), some aspects of its methodology and principles could be relevant by extension to this issue. The following elements could be relevant, although they would need to be adapted to the specific context of Laos: Sectoral Approach to Analysis: The note details a sectoral analysis process in the context of LT-LEDS development, examining sectors such as energy, agriculture, forestry, waste management, and, to some extent, transport. A similar approach, focused on identifying climate change-specific vulnerabilities and adaptation options in key sectors of the Lao economy, would be essential. Identification of Differentiated Impacts: The note places strong emphasis on analyzing the differentiated impacts of low-emission strategies on men and women. Similarly, sectoral

Framework	Key Objectives & Scope	Relevance to Sectoral Adaptation in Lao PDR
	The main component of the Guidance Note is a step-by-step methodology for integrating gender into the formulation of LT-LEDs, The note also includes annexes presenting tools for identifying gender co-benefits and for identifying challenges and opportunities for women's participation in green jobs, illustrated with concrete examples in the waste and energy sectors respectively.	adaptation analysis in Laos should examine how different groups (including men and women, rural communities, indigenous peoples, etc.) are differently affected by climate impacts within each sector and how adaptation measures can address these specific vulnerabilities. ▪ Stakeholder engagement: The LT-LEDs development process in Burkina Faso involved the participation of various government actors, civil society, and technical working groups, including a group focused on gender and inclusion. For sectoral adaptation in Laos, similar engagement of relevant sectoral ministries, civil society organizations, local communities, and other stakeholders is crucial to identify adaptation needs and appropriate solutions. ▪ Use of Existing Assessments and Data: The note highlights the importance of building on existing gender assessments, such as those carried out for NDCs or NAPs. In the context of Laos, existing sectoral vulnerability and adaptation assessments, as well as available data on climate impacts and adaptation capacities in each sector, should be used as a starting point for further analysis. ▪ Identification of Co-benefits and Risks: The note's methodology includes the identification of co-benefits (in the context of mitigation and gender equality) and risks associated with different policy options. In the context of sectoral adaptation in Laos, it would be important to identify the potential co-benefits of adaptation measures (e.g., improved food security and livelihoods) as well as potential risks (e.g., adaptation measures that could marginalize certain groups).

Framework	Key Objectives & Scope	Relevance to Sectoral Adaptation in Lao PDR
		▪ Integration into Policy and Planning: The ultimate objective of the note is to integrate gender into the LT-LEDS strategy document, including in the recommendations and the monitoring and evaluation framework. Similarly, the findings of the sectoral adaptation analysis should be integrated into sectoral development policies and plans in Laos, with monitoring and evaluation mechanisms to measure the effectiveness of adaptation measures. ▪ Qualitative Analysis Tools: The tools presented in the annexes to identify gender co-benefits and challenges and opportunities for women's participation in green jobs (Annexes I and II) could be adapted to facilitate sectoral discussions on the risks, opportunities, and challenges related to climate change adaptation for different groups in Laos. For example, similar tools could be used to assess how adaptation measures in the agricultural sector affect male and female smallholder farmers differently. In summary, although the Guidance Note focuses on mitigation and gender mainstreaming, the principles of in-depth sector analysis, stakeholder engagement, identification of differentiated impacts, and integration into policies that it advocates are fundamentally relevant for addressing the issue of sectoral adaptation to climate change in Laos (PDR). However, concrete implementation would require adaptation of the methodology and tools to the specific context of Laos and its adaptation challenges and priorities. The note does not provide specific data or analysis for Laos [no mention of Laos].

5.3 Regional Best Practices Review

Table 10: Regional Best Practices Review - Policy innovation

Adaptation Measures & Strategies	Country/ Region	Description ⁴	Success Factors & Challenges	Relevance for replicability in Lao PDR
A. Agriculture and Forestry				
A.1. Agriculture Yields				
Development of policies to support the restructuration of agricultural economy to enhance green growth and resilient agriculture.	Vietnam	Several ASEAN countries has developed action plans in agriculture sector for green growth and resilient agriculture and implement policies for the development of modern, circular, green, clean, sustainable, smart agriculture, with the capacity to withstand and adapt to climate change. Those policies focus on preferential policies to support agricultural production towards the development of commodity production, concentration, green agriculture, smart agriculture. - Decision No 923/QĐ-TTg dated June 28, 2017, on approval of the program on restructuring the agricultural economy and mitigating disaster risk and stabilizing people's lives - Decision No 3444/QĐ-BNN-KH Dated 12 September 2022 on Approving the action plan of the Ministry of Agriculture and Rural Development to implement the National Strategy on Green Growth for 2021–2030 - Decision No. 540/QĐ-TTg dated June 19, 2024, on approving the Science Development and Technology Transfer Programme to promote a circular economy in agriculture by 2030. The goal is for at least 20% of agricultural science research projects to focus on circular economy applications	Success Factors: - Creation of a policy framework for relevant stakeholders to work on, to create a modern, circular, green, clean, sustainable, smart agriculture, with the capacity to withstand and adapt to climate change. - Development of finance supporting tools (for farmers/agribusiness) - Establishment of national technical support system at the local levels Challenges / Lessons Learned: - Capacity building Need more technical and finance support - Developing guidelines for stakeholders	Shared Agro-Ecological and Climatic Contexts: Both Vietnam and Lao PDR are Mekong-region countries that face similar climate risks—such as droughts, floods, and shifting rainfall patterns—which directly affect agricultural productivity. Vietnam's experience in integrating climate risk into its agricultural restructuring provides useful insights for Lao PDR's efforts to adapt agriculture to climate change. Green Growth Integration: Vietnam's alignment of agricultural policy with green growth objectives demonstrates how productivity, environmental sustainability, and emissions reductions can be tackled simultaneously. This is particularly relevant for Lao PDR, which seeks to promote low-emission and eco-friendly agricultural development in its national and sectoral strategies. Institutional and Policy Coherence: Vietnam's success stems in part from strong coordination across ministries (Agriculture, Environment, Planning) and the development of inter-sectoral frameworks. This could serve as a blueprint for Lao PDR to strengthen institutional collaboration in implementing sectoral adaptation plans, ensuring alignment between agriculture, forestry, and natural resource management.

Development of M&E system including sets of statistical indicators for green, clean, sustainable, and smart agriculture, with the capacity to withstand and adapt to climate change	Vietnam and other ASEAN countries	Circular No. 10/2023/TT-BKHDT on the Set of statistical targets for green growth that include indicators for agriculture setors such as: Percentage of agricultural land with water saving irrigation; Area of crops/ plan/aquaculture, etc, certified for good agricultural practices (VietGAP) and equivalent; area of soil degradation	Success Factors: - Established the M&E system for green and climate-resilient agriculture from the central to local level - International collaboration Challenges / Lessons Learned: - Technical and finance support - Capacity building	Improved Decision-Making Through Data: Vietnam's approach highlights the importance of robust and context-relevant indicators to track the performance of agricultural systems in terms of sustainability, resilience, and climate responsiveness. Lao PDR currently faces data gaps in agriculture and climate monitoring; developing a similar M&E system would help generate the evidence needed for adaptive planning, policy refinement, and targeted investment. Strengthening Sectoral Adaptation Planning: A structured M&E framework would allow Lao PDR to track progress on adaptation goals at the sector level, such as increased use of resilient crop varieties, reduction of land degradation, or adoption of agroecological practices. Capacity Building and Institutional Development: Vietnam's experience underscores the need for cross-sectoral coordination and institutional capacity to operationalize such systems. Lao PDR can draw from this model to build the capacity of its Ministry of Agriculture and Forestry (MAF) and other relevant institutions to collect, manage, and analyze climate-related agricultural data. Early Warning and Risk Anticipation: Through regular tracking of environmental and socio-economic indicators, such systems can support anticipatory actions and early warning mechanisms, especially in climate-vulnerable agricultural zones. This would complement Lao PDR's efforts to improve disaster preparedness and reduce agricultural losses due to climate shocks.
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Adaptation Measures & Strategies	Country/ Region	Description ⁴	Success Factors & Challenges	Relevance for replicability in Lao PDR
A.2. Livestock / Fishstock				
Financial initiatives to upgrade facilities to be more resilient to climate change and reduce greenhouse gases emissions	Vietnam and other ASEAN countries	Loans with low interest for fishery upgrade their boats. Implementation of 'green credits' from banks/association (eg. farmer unions, women union, etc) with low interest for agriculture sector Developing national MRV system for carbon credit and testing carbon credit markets.	Success Factors: - Government supports - International collaboration - Involvement of investors and banks - Support from academia and private sector Challenges / Lessons Learned: - Capacity building (for beneficiaries and finance staffs) - Need more (official) in detail guideline for stakeholders	Bridging the Adaptation Finance Gap Like Lao PDR, Vietnam faces vulnerabilities in rural areas where climate change impacts, such as floods, droughts, and temperature variability, affect livelihoods and food security. By leveraging dedicated financial mechanisms to support climate-resilient infrastructure (e.g., irrigation systems, storage, low-emission processing), Vietnam demonstrates how targeted public, and blended finance, can help de-risk climate investments and accelerate adaptation. Supporting Smallholder Farmers and Local Economies: Financial initiatives in Vietnam often include incentives for smallholder farmers to adopt climate-smart technologies and practices (low-emission rice production, biogas systems). Such models could be replicated in Lao PDR, where smallholders dominate agricultural production, to improve both productivity and resilience while enhancing rural incomes. Catalyzing Private Sector Involvement Vietnam's example shows that financial tools, can attract private sector engagement in climate-resilient infrastructure upgrades. Lao PDR could adopt similar instruments to mobilize private capital in areas such as resilient agro-processing, renewable energy use in agriculture, or sustainable forestry enterprises. Institutional Strengthening and Capacity Building: The design and delivery of financial programs in Vietnam also involved strengthening the capacities of national and sub-national institutions to assess climate risks, develop bankable proposals, and

Adaptation Measures & Strategies	Country/ Region	Description ⁴	Success Factors & Challenges	Relevance for replicability in Lao PDR
				implement adaptation projects. This is directly applicable to Lao PDR, where institutional and technical capacity remains a key barrier to scaling up climate adaptation finance.
A.3. Soil Quality				
Develop a database for soil quality management in the agriculture & forestry areas	Thailand, Vietnam, Indonesia, Malaysia, Philippines	Thailand has established a comprehensive national soil database managed by the Land Development Department (LDD). This database includes detailed soil maps and fertility data, which are instrumental in guiding land use planning, agricultural zoning, and the promotion of sustainable farming practices.⁹ Vietnam maintains a national soil information system (Pedometric map, periodic soil degradation & soil pollution survey) that supports agricultural planning and land management. The system provides data on soil types, properties, and distribution, aiding in crop selection and sustainable land use decisions¹⁰. Indonesia, Malaysia and Philippines have developed similar soil information system and data base that offers data on soil characteristics and suitability for various crops to support decision-making in agriculture and land management.	Challenges / Lessons Learned: - Data availability - Not enough technical and financial support	Support for Climate-Resilient Agriculture: Soil data can guide climate-resilient agricultural practices—like crop suitability zoning, water-efficient farming, and erosion control—which is essential given Lao PDR's exposure to climate hazards such as drought and floods. Land Use Planning and Forest Management: Forestry and upland agriculture are dominant in Lao PDR. Accurate soil data helps reduce land degradation, support reforestation programs, and optimize agroforestry systems, especially in hilly or erosion, prone regions. Enabling Informed Adaptation Planning: Integrating soil quality into CRVA and SAPs allows for evidence-based decisions on adaptation measures like conservation agriculture, agroecology, and watershed management. Food Security and Livelihoods: Improved soil management increases productivity and sustainability for smallholder farmers, who form the backbone of Lao PDR's agricultural sector.

⁹ reference

¹⁰ reference

Adaptation Measures & Strategies	Country/ Region	Description ⁴	Success Factors & Challenges	Relevance for replicability in Lao PDR
A.4. Forest biodiversity				
Develop national frameworks for biodiversity conservation that encompass policies supporting local livelihoods, promoting the use of native plants for afforestation, and expanding biodiversity conservation areas	Indonesia, Malaysia, Philippines, Thailand	Several ASEAN countries have developed national frameworks for biodiversity conservation that encompass policies supporting local livelihoods, promoting the use of native plants for afforestation, and expanding biodiversity conservation areas. These initiatives align with the ASEAN Biodiversity Plan and the ASEAN Comprehensive Recovery Framework, aiming to integrate biodiversity conservation with sustainable development goals. Indonesia's National Biodiversity Strategy and Action Plan (NBSAP) emphasizes community-based forest management and the integration of local communities in conservation efforts. The country has implemented programs that encourage the use of indigenous plant species in reforestation and afforestation projects, recognizing the importance of native biodiversity in ecosystem restoration. Additionally, Indonesia has expanded its network of protected areas, aiming to preserve critical habitats and support local economies through eco-tourism and sustainable resource use.	Success Factors: - Government support - International collaboration - Support from (local) NGO, organization, academia Challenges / Lessons Learned: - Finance and technical supports - Need more guidelines from the government/local authorities to better engaging stakeholders	Enhancing Ecosystem-Based Adaptation (EbA): Indonesia and Malaysia demonstrate how biodiversity conservation can serve as a key adaptation strategy, especially through ecosystem-based approaches. By maintaining and restoring healthy ecosystems—such as forests, wetlands, and watersheds—these countries reduce climate risks like flooding, landslides, and drought. In Lao PDR, where forest ecosystems are vital for regulating water and climate cycles, this approach could significantly enhance climate resilience at both community and landscape levels. Protecting and Enhancing Rural Livelihoods: Both countries have designed conservation frameworks that explicitly link biodiversity with community well-being, such as through agroforestry, ecotourism, and sustainable forest product harvesting. Lao PDR, with a large rural population dependent on forest ecosystems, can draw from these models to develop community-based conservation efforts that simultaneously protect biodiversity and reduce vulnerability to climate shocks. Expanding and Managing Conservation Areas for Resilience: Both Indonesia and Malaysia have significantly increased the coverage and management of protected areas, recognizing their role in buffering climate impacts. Lao PDR can replicate this by expanding biodiversity-rich conservation zones, especially in climate-vulnerable areas, and integrating them into national adaptation planning. Protected areas can also act as climate refuges for species and communities during extreme weather events.

Adaptation Measures & Strategies	Country/ Region	Description ⁴	Success Factors & Challenges	Relevance for replicability in Lao PDR
				Institutional and Policy Coherence: Both countries have demonstrated the importance of having coherent policy frameworks and inter-agency coordination to manage biodiversity under climate change pressures. This is particularly relevant for Lao PDR, where responsibilities for biodiversity, forests, and adaptation are spread across different ministries and departments. Strengthening governance and coordination would improve implementation and long-term sustainability of adaptation efforts.
B. Urban Development & Transport				
B.1. Urban Infrastructure				
Develop policy framework to modernizing transport systems, networks, and vehicles based on energy saving, high economic and environmental efficiency, and resilience to climate change	Vietnam, Indonesia, Singapore	Several ASEAN countries have developed policy frameworks to modernize their transport systems, focusing on energy efficiency, environmental sustainability, and climate resilience. These efforts align with the ASEAN Transport Strategic Plan 2016–2025 and the ASEAN Regional Strategy on Sustainable Land Transport. Vietnam has a developed national action plan to reduce greenhouse gases emission from transportation sector (Eg. Decision No. 876 on Action Program for Transition to Transition to green energy and mitigation of carbon dioxide and methane emissions from transportation (hereinafter referred to as "the Action Program for Transition to Green Energy" in Vietnam). Vietnam has also developed a national standard for vehicle emission	Success Factors: - Government support - International collaboration - Support from (local) NGO, organization, academia Challenges / Lessons Learned: - Finance and technical supports - Need more guidelines from the government/local authorities to better engage stakeholders	Enhancing Climate Resilience of Infrastructure: For Lao PDR, where flooding, and extreme weather events threaten rural and urban connectivity, adopting climate-resilient planning tools and guidelines, could protect infrastructure investments and reduce long-term climate vulnerability. Integrating Transport with Urban and Land Use Planning and Promote Low-Carbon, Sustainable Mobility: Countries like Indonesia and Thailand have emphasized transit-oriented development and the integration of transport with broader land-use policies. For Lao PDR, particularly in rapidly urbanizing areas like Vientiane, such integration could guide the development of more adaptive and inclusive urban spaces, supporting both mobility and climate resilience. Additionally, transitioning toward low-emission transport options, such as public transportation, cycling infrastructure, and electric vehicles would contribute to mitigation co-

Adaptation Measures & Strategies	Country/ Region	Description ⁴	Success Factors & Challenges	Relevance for replicability in Lao PDR
		- Indonesia has implemented policies promoting low-carbon transport modes, energy efficiency, and integration of transport and land use planning. These initiatives aim to reduce greenhouse gas emissions and enhance the resilience of transport infrastructure to climate change impacts - Singapore's Green Plan 2030 includes comprehensive strategies for sustainable transport, such as expanding the electric vehicle charging network, enhancing public transport systems, and promoting active mobility. These initiatives aim to reduce emissions and improve the resilience of the transport sector to climate change.		benefits while enhancing urban resilience and reducing dependence on fossil fuels. Building Institutional and Technical Capacity: Many ASEAN peers have developed national strategies that include monitoring frameworks, inter-ministerial coordination mechanisms, and technical standards for sustainable transport. Lao PDR could benefit from capacity-building programs and regional knowledge exchange to strengthen institutional ability to design and implement climate-smart transport policies. Leveraging Regional Frameworks and Financing: By aligning with the ASEAN Transport Strategic Plan and leveraging support from development banks and climate finance mechanisms (such as the Green Climate Fund), Lao PDR can mobilize resources for modernizing transport while meeting climate commitments.
B.2. Degradation of urban ecosystems				
Plan and develop green growth urban areas towards sustainable smart cities, low emissions, resilient to climate change and natural disasters, multiple disasters based on digital technology platforms	Singapore, Malaysia, Vietnam	Many ASIA countries set policy to develop green/eco/smart cities¹¹. Singapore's Green Plan 2030 includes comprehensive strategies towards green growth in the urban layout of cities by prioritizing climate-resilient infrastructure, integrated urban planning, and green space development	Success Factors: - Government support - International collaboration - Stakeholder engagement Challenges / Lessons Learned:	The planning and development of green growth urban areas, offer several valuable lessons and opportunities for replicability in Lao PDR, especially in the context of urban climate adaptation, digital innovation, and sustainable development. Advancing Urban Resilience Planning in Lao Cities: Lao PDR, particularly fast-growing urban centers such as Vientiane, Luang Prabang, and Pakse can adapt similar approaches to: (1) Reduce vulnerability to floods, heatwaves, and storms through climate-sensitive urban design, (2) Integrate multi-hazard risk assessments into urban planning frameworks,

¹¹ <https://www.adb.org/green-cities/>

Adaptation Measures & Strategies	Country/ Region	Description ⁴	Success Factors & Challenges	Relevance for replicability in Lao PDR
		- Malaysia's Green Technology Master Plan (2017–2030) lays out strategies to mainstream green technology across sectors, including urban development. It supports initiatives that promote energy-efficient buildings, sustainable transportation, and integrated urban planning. - Vietnam has adopted a comprehensive framework for green urban development through multiple high-level strategies: Resolution No. 06-NQ/TW (2022) issued by the Politburo sets the strategic direction for sustainable urban development to 2030, with a vision to 2045. It emphasizes the transformation of urban areas into low-emission, smart, and climate-resilient spaces. Circular No. 01/2018/TT-BXD, issued by the Ministry of Construction, provides urban green growth indicators. These indicators guide local governments in planning and assessing progress toward green urbanization, including metrics related to energy efficiency, land use, environmental quality, and infrastructure sustainability. This circular serves as a practical tool to integrate green growth	- Finance and technical support - Capacity Building	(3) Guide the development of secondary cities with sustainability and resilience as core principles. Leveraging Digital Platforms for Smart, Climate-Responsive Cities: Lao PDR could develop urban early warning systems and real-time climate monitoring using IoT and GIS tools., and use smart transportation, energy, and waste systems to reduce GHG emissions in urban areas. Promoting Low-Carbon Urban Development and Green Growth: These policies focus on aligning urban expansion with green growth goals, something increasingly relevant to Lao PDR as it urbanizes. Replication could include: (1) Developing urban green growth strategies at the municipal level, (2) incentivizing energy-efficient buildings, renewable energy integration, and low-emission transport in new urban development, (3) aligning urban policy with NDC targets and Lao PDR's <i>Green Growth Strategy</i>.

Adaptation Measures & Strategies	Country/ Region	Description ⁴	Success Factors & Challenges	Relevance for replicability in Lao PDR
		objectives into urban planning processes.		
B.3. Urban Clean Up				
Policies to support finance initiative for waste management	Indonesia, Singapore, Malaysia, Cambodia, Thailand, Philippines	Several ASEAN countries have developed policies and financial initiatives to support waste management, aiming to enhance environmental sustainability and promote green growth. - Indonesia has implemented comprehensive fiscal policies to bolster waste management effort with: Fiscal Incentives: The government provides financial support to local governments and private institutions through the state budget, covering activities such as waste reduction, recycling, transportation, and processing. Regulatory Framework Presidential Regulation No. 97/2017 outlines the National Strategy Policy on Managing Domestic Waste, emphasizing coordination between central and local governments, development of information systems, and incentive mechanisms. - Singapore's Green Plan 2030 sets ambitious targets for waste management, especially with the <i>*Zero Waste Goals</i> that aims to reduce landfill needs by minimizing waste generation	Success Factors: - Government support - International collaboration Challenges / Lessons Learned: - Finance and technical support - Stakeholder engagement	Mobilizing Public and Private Finance: Initiatives such as Indonesia's fiscal incentives and Singapore's innovation funds show how targeted financing mechanisms can unlock investment in waste infrastructure. Lao PDR could replicate similar instruments—such as government-backed grants or public-private partnership (PPP) models—to attract private sector involvement in building sustainable waste treatment facilities. Strengthening Regulatory and Institutional Frameworks: Countries like Malaysia and the Philippines have robust legal frameworks (e.g., Solid Waste Management Acts) that clearly define responsibilities and funding mechanisms. Lao PDR could adapt and develop national legislation that sets standards for waste segregation, promotes circular economy practices, and enables municipalities to generate or access funding for service improvements. Enhancing Resilience through Integrated Planning: Integrated waste and wastewater management systems, such as those piloted in Indonesia and the Philippines, can help reduce exposure to climate risks like flooding and pollution. Lao PDR could replicate such approaches in urban and peri-urban areas particularly vulnerable to climate impacts.

Adaptation Measures & Strategies	Country/ Region	Description ⁴	Success Factors & Challenges	Relevance for replicability in Lao PDR
		and increasing recycling rates and the creation of the Innovation for Environmental Sustainability Fund supports companies in developing recycling technologies and projects that contribute to environmental sustainability. - Malaysia has established a legal and policy framework to manage solid waste with Solid Waste and Public Cleansing Management Act 207: This act regulates the management of controlled solid waste and public cleansing to maintain proper sanitation. Green Technology Master Plan (2017–203): The plan promotes the integration of green technology in waste management, encouraging sustainable practices and the development of green industries.		
B.4. Hydraulic infrastructure (urban areas)				
Master plan greener and develop hydraulic infrastructure to reduce impact of climate change	Singapore, Philippines, Thailand	Several ASEAN countries have developed master plans and invested in hydraulic infrastructure to mitigate the impacts of climate change, focusing on flood control, water security, and sustainable urban development. Singapore has implemented a comprehensive approach to water management through its "Four National Taps" strategy, which includes local	Success Factors: - Government support - International collaboration - Support from (local) NGO, organization, academia	The relevance of replicating these ASEAN initiatives in Lao PDR lies in their potential to strengthen national climate resilience, particularly in the water and urban development sectors. Lao PDR is highly dependent on water resources for agriculture, hydropower, and livelihoods. As climate variability increases the frequency and severity of floods and droughts, adopting integrated water resource management and investing in hydraulic

Adaptation Measures & Strategies	Country/ Region	Description ⁴	Success Factors & Challenges	Relevance for replicability in Lao PDR
		catchment water, imported water, NEWater (recycled water), and desalinated water. The country has developed advanced hydraulic infrastructure such as reservoirs, desalination plants, and the Deep Tunnel Sewerage System to enhance water security and resilience against climate change impacts. ▪ The Philippines has initiated the Flood Management Master Plan for Metro Manila, aiming to modernize and construct new pumping stations and invest in infrastructure along waterways to manage future floods. This plan is part of the country's broader efforts to adapt to climate change and reduce the risk of natural disasters. ▪ Thailand has developed a draft National Master Plan on Climate Change (2011–2050), which includes strategies for enhancing water resource management and developing hydraulic infrastructure to address climate-related challenges. The plan emphasizes the integration of climate change adaptation into national development policies.	Challenges / Lessons Learned: - Finance and technical supports - Stakeholder engagement - Capacity Building	infrastructure, as seen in Singapore and Thailand, can enhance resilience. This includes: (1) Building or upgrading reservoirs and flood retention systems, (2) Investing in multi-use hydraulic infrastructure (e.g., flood control + irrigation), (3) Leveraging nature-based solutions such as wetlands or reforestation to reduce runoff and erosion. Examples like Vietnam's Resolution No. 06-NQ/TW and Thailand's National Climate Change Master Plan demonstrate how embedding climate adaptation into urban and infrastructure planning can ensure long-term sustainability. Replicating this in Lao PDR would support Climate-resilient spatial planning, especially in urbanizing areas, the inclusion of green growth and low-emission development pathways, and localized adaptation planning aligned with national goals. Supporting Regional Alignment and Cooperation: By drawing on ASEAN models, Lao PDR can align its climate strategies with regional standards and financing mechanisms, thereby: (1) Accessing regional technical expertise and knowledge exchange platforms, (2) Attracting climate finance for infrastructure projects, (3) Ensuring transboundary river management and flood mitigation efforts are harmonized.
C. Water Resources				
C.1. River and reservoir flows				
Developing master plans for river basins	Thailand, Philippines,	Several ASEAN countries have developed master plans for river basin management to address challenges such as water security, pollution control,	Success Factors: - Government support	The development and implementation of river basin master plans in other ASEAN countries offer highly relevant lessons and replicability potential.

Adaptation Measures & Strategies	Country/ Region	Description ⁴	Success Factors & Challenges	Relevance for replicability in Lao PDR
	Cambodia, Vietnam	climate resilience, and sustainable development. An important strategy for improving environmental status of water resources, a strategy recognized by a number of international IWRM frameworks. ▪ Thailand has implemented a 20-year master plan on water management (2018–2037) through the Office of the National Water Resources (ONWR). This plan includes the establishment of 22 River Basin Committees to oversee local water governance and the enactment of the Water Resources Act B.E. 2561 (2018) to provide a legal framework for integrated water resource management. ▪ The Philippines has developed the Climate Responsive Integrated Master Plan for the Pampanga River Basin, focusing on flood control, water resource management, and climate adaptation strategies. ▪ Cambodia is participating in the Integrated River Basin Management (IRBM) Project, aiming to reduce pollution and preserve environmental flows in key river basins. Additionally, Cambodia has initiated the Funan Techo Canal project, intended to connect the Mekong River near Phnom Penh to the Gulf of Thailand, enhancing irrigation and transportation infrastructure. ▪ Vietnam is actively involved in the Mekong River Commission's Basin	- International collaboration - Support from (local) NGO, organization, academia Challenges / Lessons Learned: - Finance and technical supports - Stakeholder engagement - Capacity Building	Integrated Water Resource Management (IWRM): Countries like Thailand and Vietnam have successfully institutionalized IWRM through national policies and river basin committees. Lao PDR can replicate these governance mechanisms to ensure more coordinated and participatory water management at both national and local levels. Climate Resilience and Risk Reduction: The Climate Responsive Integrated Master Plan of the Philippines for the Pampanga River Basin and Vietnam's Mekong Basin Strategy show how river basin planning can be used as a tool for climate risk management—addressing floods, droughts, and other climate-induced hazards. These strategies offer useful models for Lao PDR, where river-dependent communities are particularly vulnerable to extreme weather events. Data-Driven and Evidence-Based Planning: Several ASEAN countries have invested in climate-informed water management strategies, including hydrological modeling and environmental flow assessments. Adopting similar practices in Lao PDR can enhance the scientific basis for adaptation planning and infrastructure development. Support from International Frameworks: Participation in regional platforms like the Mekong River Commission and initiatives such as the Integrated River Basin Management (IRBM) project provide Lao PDR with access to technical expertise, funding, and peer learning. Replicating best practices from neighboring countries can strengthen Lao's contributions to and benefits from such collaborations.

Adaptation Measures & Strategies	Country/ Region	Description ⁴	Success Factors & Challenges	Relevance for replicability in Lao PDR
		Development Strategy 2021–2030, which outlines sustainable management and development of the Mekong River Basin's water and related resources.		
C.2. Hydraulic infrastructure				
National program to upgrade (and greener) dyke and drainage system to reduce impact of climate change and disaster risk	Vietnam, Thailand	Many countries have national plan to upgrade the dyke and drainage systems to reduce impact of disaster risks. These efforts focus on strengthening flood defenses, improving water management, and building resilience in vulnerable communities. ▪ Vietnam has implemented comprehensive programs to upgrade its dyke and drainage infrastructure: with program such as the Sea Dyke Investment Program but also by reinforcing the Legislative Framework: with new laws such being enacted such as the Law on Natural Disaster Prevention and Control and the Law on Dyke Management, providing a legal basis for the maintenance and enhancement of dyke systems. ▪ Thailand has undertaken measures to improve its flood management infrastructure: especially with the: - 20-Year Water Management Master Plan (2018–2037): This plan encompasses the development and upgrading of water management systems, including dykes and drainage, to address flood risks and enhance climate resilience.	Success Factors: - Government support - International collaboration Challenges / Lessons Learned: - Finance and technical supports	Replicating national programs for dyke and drainage system upgrades, as seen in ASEAN countries like Vietnam, Thailand, Indonesia, Malaysia, and the Philippines, could hold significant relevance for Lao PDR in terms of climate change adaptation and disaster risk reduction. Strengthening Climate Resilience in Flood-Prone Areas: Lao PDR, with its mountainous terrain and river-dependent communities, is highly vulnerable to seasonal flooding and increasing rainfall variability due to climate change. Adopting Vietnam's and Thailand's approaches to upgrading dyke and drainage systems could: (1) Reduce flood risks in low-lying areas like the Mekong River Basin. (2) Minimize agricultural losses and infrastructure damage. (3) Protect vulnerable communities and critical economic zones. Improving Infrastructure Standards: Lao PDR could develop national standards for resilient dyke construction, integrate climate projections into infrastructure planning, and encourage investment in long-term, green public works. Promoting Multi-Stakeholder and Basin-Level Planning through decentralized water governance through river basin committees (e.g. Thailand), which could inspire Lao PDR to coordinate water management across provinces and borders and include local knowledge in planning and monitoring.

Adaptation Measures & Strategies	Country/ Region	Description ⁴	Success Factors & Challenges	Relevance for replicability in Lao PDR
		- Establishment of River Basin Committees: These committees are responsible for overseeing local water governance, ensuring that flood management strategies are tailored to regional needs.		Mobilizing Climate Finance and Technical Assistance: Vietnam and Indonesia have tapped into climate funds and international technical support or such projects.
C.3. Water quality & Underground water				
Developing policy for wetland conservation s	Indonesia, Malaysia,	Countries like Vietnam and China, also established guideline for the local create the wetland conservation area	Success Factors: - Government support - International collaboration Challenges / Lessons Learned: - Finance and technical supports - Capacity development	Several ASEAN countries have developed and implemented policies for wetland conservation, recognizing the ecological, economic, and social importance of these ecosystems. These efforts are often aligned with international commitments, such as the Ramsar Convention on Wetlands, and regional frameworks like the ASEAN Peatland Management Strategy. Similarly, Lao PDR has developed national policies for wetland conservation, including the designation of Ramsar sites and participation in regional initiatives like the ASEAN Peatland Management Strategy, the country focuses on sustainable management of wetlands to support biodiversity and local livelihoods. These efforts could still be strengthened and could learn from other countries' initiatives like: Indonesia which has designated multiple wetlands as Ramsar sites and has implemented national policies focused on wetland and peatland conservation. The country has established over 100 marine protected areas and aims to increase this to 30% of its maritime area by 204. Indonesia's conservation framework includes 55 national parks, covering around 9% of the country's surface area, with several recognized as World Heritage Sites and part of the World Network of Biosphere Reserve.

Adaptation Measures & Strategies	Country/ Region	Description ⁴	Success Factors & Challenges	Relevance for replicability in Lao PDR
				Malaysia which has developed national policies for wetland conservation, including the designation of Ramsar sites and the implementation of integrated management plan. The country actively participates in the ASEAN Peatland Management Strategy and has undertaken initiatives for Peatland restoration and Sustainable Management Strategy.

Table 11: Regional Best Practices Review - Technical innovation

Adaptation Measures & Strategies	Country / Region	Description	Success Factors & Challenges	Challenges/ Lessons Learned	Relevance for Lao PDR & Potential Adaptation
A. Agriculture and Forestry					
A.1. Agriculture Yields					
Using crop resilient to abiotic stress (drought-tolerant or flood-resistant crop varieties ¹² Using crops/plants resilient to biotic stress (Eg. pest and disease tolerant crops)	Vietnam, Thailand, Myanmar	Research and apply resilient crop (eg. Rice, maize, etc) varieties (including research on the application of local crop) to mitigate impact of climate change and extreme events. This solution appears in NAP on climate change response and climate smart agriculture in many countries such as Vietnam, Thailand, etc. Research and apply biotic stress crops/plants to mitigate impact of the increase of biotic risks due to climate change (climate change challenges, including increased temperatures, changes in rainfall patterns,	Policy support Involvement of multiple stakeholders (Government, Ministries, NGOs, International agencies (AFD, IFAD, DFAT, etc.), private sectors, academic, farmers, etc	- Financial and technical support -Capacity building -Market orientation -Stakeholder engagements	Adapt to crop sectors in drought and flood impacted areas

¹² <https://www.frontiersin.org/journals/plant-science/articles/10.3389/fpls.2022.860802/full>

Adaptation Measures & Strategies	Country / Region	Description	Success Factors & Challenges	Challenges/ Lessons Learned	Relevance for Lao PDR & Potential Adaptation
		and more frequent extreme weather events, which can exacerbate biotic stress) ¹³ .	Technological support from IRRI, etc		
Restructuring crop ¹⁴	Vietnam	Basing on nature conditions and the projection of climate change in each region, the government establish the restructuring crop program which provides information of a list of crop/plan should be cultivated in each area. Base on that information the agriculture departments and supporting institutes at the local level could provide guidelines, technical supports and event financial supports for farmer to adapt to climate change. Eg. The restructuring crop in lower Mekong River delta in Vietnam	- Policy support - Customer demand for fresh and saved foods - Involvement of multiple stakeholders (Government, Ministries, academia, international collaboration), private sectors - Technological supports - Traditional knowledge	- Financial and technical support - Capacity building - Stakeholder engagements	Adapt to crop sectors
Agroforestry	Vietnam	Integrates trees and shrubs into farming/forestry practices, offering benefits such as improved biodiversity, soil health, and carbon sequestration. Agroforestry includes landscape-based solutions, and relating models that	- Policy support - international collaboration - Support from academia. Local organizations - Local knowledge	- Capacity building - Stakeholder engagement - Need more technical & finance supports - Market linkage	Useful for upland forest communities facing climate and land pressure.

¹³ <https://pmc.ncbi.nlm.nih.gov/articles/PMC9290814/>

¹⁴ <https://www.undp.org/vietnam/publications/agricultural-transformation-model-adapting-climate-change-mekong-delta>

Adaptation Measures & Strategies	Country / Region	Description	Success Factors & Challenges	Challenges/ Lessons Learned	Relevance for Lao PDR & Potential Adaptation
A.2. Livestock / Fishstock					
Breed and Species Selection		Use of climate-resilient breeds: Choose livestock breeds that are tolerant to heat, drought, and diseases (e.g., indigenous or crossbreeds). Genetic improvement programs: Promote selective breeding for productivity and resilience traits.	- Policy support - international collaboration - Support from academia. Local organizations	- Capacity building - Stakeholder engagement - Technology and Finance support	
Feed and Nutrition Management	Laos (DFAT project)	Research and promote the local people proactive get information and training to prepare food for animals Eg. Drought-tolerant forage crops, apply fodder conservation techniques; Use feed additives and balanced rations to reduce enteric methane emissions and improve productivity.	- Policy support - international collaboration - Support from academia. Local organizations	- Capacity building - Stakeholder engagement - Technology and Finance support	
A.3. Soil Quality					
Practicing crop rotation and intercropping to maintain soil fertility and improve pest management	ASEAN (eg. Vietnam, Thailand, etc)	Crop rotation, a time-honored practice, involves the sequential cultivation of different crops on the same land to enhance soil fertility, minimize pests and diseases, and optimize resource utilization. Various crop rotation cycles, including three-year and four-year rotations, along with examples such as legumes, grains, and cover crops, illustrate the versatility and benefits of this approach. Intercropping, on the other hand, entails growing two or more crops simultaneously in the same field, exploiting complementary interactions to enhance productivity, resource efficiency, and resilience Eg. Intercropping: cassava/maize & peanut/beans	-Policy supports - Involvement of multiple stakeholders (Government, Ministries, academia, international collaboration) - Traditional knowledge	- Financial and technical support - Capacity building - Stakeholder engagements	Adapt to crop sectors

Adaptation Measures & Strategies	Country / Region	Description	Success Factors & Challenges	Challenges/ Lessons Learned	Relevance for Lao PDR & Potential Adaptation
		Intercropping melons, squash, (lowest layer - spreading on the ground), taro, sesame, peanuts, beans (2nd layer) on corn fields (3rd highest layer); ¹⁵ Intercropping sesame/millet and peanuts; Intercropping cotton with melons; Intercropping corn with cassava; intercropping fish/crab/shrimp-rice/pineapple, intercropping pineapple, betel palm and coconut in the same fields and growing bananas and plants with edible roots, ... Rotation: lotus- rice; rice- vegetable/potato...			
Fertilizer management	Vietnam, EU	By optimizing fertilizer use, farmers can increase crop resilience, enhance soil health, and reduce greenhouse gas emissions. This involves applying the right nutrients at the right rate, time, and place, while also considering the specific needs of different crops and soil types. Considering of applying slow-release fertilizer, enhancing soil health with organic fertilizer, precision fertilization techniques, nitrogen management and low-carbon fertilizers, nitrogen management and low-carbon fertilizer,	- Policy support -National and international collaboration -Upgraded technology - Market demand	- Finance -Stakeholder engagement - Lack of data	
A.4. Forest biodiversity					
Social Forestry Program Community Forest Management	Indonesia, Thailand (South East Asia)	Provides local communities with legal access to forest land to sustainably manage and protect it. Eg. In Vietnam, there are currently two types of forest certification management models: individual certification (issued to a single forest owner) and group	-Policy support	- Guideline to follow the national policy	Useful for upland forest communities facing climate

15 Traditional knowledge from Thai ethnic group in Vietnam. The knowledge has been applied in several provinces in Vietnam such as Nghe An province

Adaptation Measures & Strategies	Country / Region	Description	Success Factors & Challenges	Challenges/ Lessons Learned	Relevance for Lao PDR & Potential Adaptation
		certification (issued to multiple forest owners who collaborate in sustainable forest management, with one legal entity designated as the group representative), primarily for forest owners with small-scale forest areas Local communities co-manage forests under legal frameworks, promoting reforestation and forest fire prevention.		- Capacity building - Stakeholder engagement - Need more technical & finance supports	and land pressure.
Establish sustainable forest management standard & other forest standard Announce national program on sustainable forest management	ASEAN (eg. Vietnam)	To develop a framework that addresses the ecological, social, and economic aspects of forest use. This involves creating a set of guidelines, requirements, and best practices that ensure forests are managed responsibly, conserving their biodiversity, promoting long-term health, and benefiting local communities. That includes encouragement to grow local plants, Eradicating hunger and poverty in key forestry areas by encouraging the engagement of mountainous communities and ethnic minorities in forestry production	-Policy support - international collaboration - Finance support - market based approach		
B. Urban Development & Transport					
B.1. Urban Infrastructure					
Low Carbon Mobility Blueprint	Malaysia Singapore	Development of an urban transport strategy including e-mobility, modal shift, and resilient infrastructure design. Integration of active mobility (walking, cycling) with public transit to reduce emissions and increase climate resilience.			Relevant for urban planning in cities undergoing growth such as Vientiane

Adaptation Measures & Strategies	Country / Region	Description	Success Factors & Challenges	Challenges/ Lessons Learned	Relevance for Lao PDR & Potential Adaptation
B.2. Degradation of urban ecosystems					
Bangkok Green Infrastructure & Urban Cooling Project	Thailand (South East Asia)	Expansion of urban green spaces (e.g., Chulalongkorn University Centenary Park) designed to manage urban flood risk and reduce heat island effects.	Collaboration between academia, local authorities, and communities.		
Climate-Responsive Urban Planning in Marikina City	Philippines (South East Asia)	Integration of flood zoning, green infrastructure, and early warning systems in land use planning.			
B.3. Urban Clean Up					
Blue-Green Infrastructure in cities	China, EU, Australia, ASEAN	Create a naturally oriented water cycle while contributing to the amenity of the city by bringing water management and green infrastructure together. This is achieved by combining and protecting the hydrological and ecological values of the urban landscape while providing resilient and adaptive measures to deal with flood events Eg. Utilizing permeable pavements, rain gardens, and other green infrastructure can help to manage stormwater runoff and reduce flooding risks. Hanoi, Vietnam's ongoing efforts to increase green spaces, including the restoration of the West Lake and the creation of new parks, demonstrate a commitment to climate change adaptation	-Policy support -International collaboration - Involvement of NGOs, private sector, academia,	-Technical and finance support -Capacity building	
B.4. Hydraulic infrastructure (urban areas)					
Early Warning and Community Based Flood Monitoring	Indonesia, Vietnam (South East Asia)	Community flood monitoring systems + integration with city drainage upgrades.	- Use of tech (GIS, remote sensing - International collaboration - Community engagement - Government-Academia collaboration	(need more) technical and financial support	Can be adapted for sewer sytems and easily flooded areas.

Adaptation Measures & Strategies	Country / Region	Description	Success Factors & Challenges	Challenges/ Lessons Learned	Relevance for Lao PDR & Potential Adaptation
Sustainable sewage/drainage project	Vietnam (South East Asia)	The Binh Duong Province Water Environment Improvement Project funded by WB. The project incorporated energy-efficient technologies like LED lighting and solar panels, and promotes the reuse of treated sludge and wastewater. Besides, Tham Luong-Ben Cat and West Saigon Basin Drainage Projects funded by ADB developed drainage and wastewater systems, aiming to reduce flooding and water pollution.	Energy efficient technologies Reuse Long term maintenance		Can be fully adapted to sectorial adaptation
C. Water Resources					
Early Warning and Community Based Flood Monitoring (Project NOAH)	Philippines (South East Asia)	Real-time flood forecasting and community-based disaster preparedness tools. Project NOAH in Philippines	Use of tech (GIS, remote sensing) Government-Academia collaboration		Can be adapted for riverine and flash flood areas (e.g., around Mekong tributaries).
Integrated River Basin River Management	Vietnam (South East Asia)	Coordination between provinces and sectors for sustainable water use and flood risk reduction.	Inter-agency coordination Donor-supported capacity building.		A model for integrated planning across watersheds.

6 Desk review and Gap Analysis for Sectoral Adaptation

A review and gap analysis of legislation, laws, and regulations in Lao PDR, along with recommendations for addressing these gaps.

A comprehensive desk review of international guidelines, national plans, and strategies will also be provided (vi) review of existing assessment and ensuring these documents will be integrated in the Lao ' Sectoral Adaptation Plan (SAP).

Identifying gaps in current policies and regulations regarding the climate adaptation to strengthen sectorial adaptation measures.

6.1 Legislative and Regulatory Review & Gap analysis

Key Legislative Barriers and Challenges

The regulatory landscape in Lao PDR reveals several potential barriers and challenges to achieving comprehensive climate change adaptation, as evidenced within the provided legal documents. While the "Decree on Climate Change date 18 September 2019" establishes a national framework, a significant challenge may lie in the translation of its broad objectives into specific, actionable regulations and implementation plans across various sectors. The decree outlines areas such as greenhouse gas mitigation and adaptation, but the absence of detailed regulatory frameworks at lower levels with clear mandates and resource allocation could impede concrete adaptation progress. Furthermore, while international cooperation is mentioned, the decree may lack explicit mechanisms for effectively directing international climate finance and technical assistance towards local adaptation projects.

The "Law on disaster management date 5 August 2019" primarily addresses disaster risk reduction, preparedness, response, and recovery. A potential barrier arises from the law's emphasis on immediate disaster management, which may not sufficiently integrate long-term climate change projections and proactive adaptation strategies. The focus tends to be on reacting to immediate events rather than building resilience to the increasing impacts of climate change over time. Although the law establishes organisational structures for disaster management, the effectiveness of these structures in coordinating and implementing anticipatory climate change adaptation measures across sectors could be hindered by a lack of specific adaptation mandates and dedicated resources.

The "Law on environmental protection revision, date 12 August 2024" provides a general legal framework for environmental preservation, which is inherently linked to climate change. However, a challenge is the limited presence of specific articles or detailed regulations explicitly addressing climate change adaptation within different environmental sectors such as biodiversity and land management. While environmental impact assessments are mentioned, more specific guidance might be needed to ensure these assessments adequately consider future climate change risks and incorporate adaptation measures. Moreover, the enforcement and monitoring of environmental regulations, crucial for effective adaptation, could be constrained by limited resources and institutional capacity.

Regulations such as the "Law on Lao red cross, date 8 December 2017" and the "Decree on Emergency Relief Fund, date 23 August 2023" predominantly focus on emergency response and relief efforts. While these are essential for addressing the immediate consequences of climate-related disasters, they may not directly address the proactive, long-term adaptation measures required to reduce vulnerability and enhance resilience. The

Emergency Relief Fund aims to provide timely assistance, but its emphasis is on immediate humanitarian aid rather than funding projects that build long-term adaptive capacity within communities or sectors.

Finally, the "Law on meteorology and hydrology, date 21 December 2017" is crucial for providing climate information. A potential barrier could be related to the accessibility, granularity, and dissemination of climate data and forecasts in a format relevant for specific adaptation planning and decision-making at various levels. If the meteorological and hydrological information is not tailored to the adaptation needs of different sectors, its utility in achieving climate resilience may be limited. Furthermore, the capacity to generate and effectively communicate long-term climate change projections, beyond short-term weather forecasts, could present a challenge.

In summary, while Lao PDR possesses relevant legal frameworks for climate change and disaster management, achieving comprehensive climate change adaptation through these regulations may be hindered by the lack of detailed sector-specific implementation plans, insufficient integration of long-term climate change considerations into disaster management, limited explicit adaptation provisions in environmental law, a primary focus of emergency response regulations on immediate relief, and potential limitations in accessible and relevant climate information. Addressing these regulatory gaps is vital for enhancing Lao PDR's adaptive capacity to the impacts of climate change.

Water Sector:

Lao PDR's water sector regulations, drawing upon the "Law on Irrigation, date 17 January 2013", the "Law on Aquatic Animal and Fishery, 30 August 2023", the "Law on Water and Water Resources, date 22 June 2017", the "Law on Dam Safety, date 19 August 2022", and the "Law on Water Way, 10 February 2023", reveals potential barriers to effective water resource management. A key challenge lies in the harmonisation and integration of these distinct legal frameworks in different ministries. The existence of separate laws for irrigation, fisheries, general water resources, dam safety, and waterways necessitates robust coordination mechanisms to ensure policy coherence and avoid regulatory fragmentation. The absence of clearly defined integrated management approaches across these legal instruments could impede holistic water resource governance.

Further challenges arise from the level of regulatory specificity and clarity in certain areas. While overarching legislation like the "Law on Water and Water Resources" establishes a broad framework, the operationalisation of its principles requires detailed, sector-specific regulations and technical standards. Gaps in precise guidelines, particularly concerning water quality, permitting processes, and enforcement protocols, can lead to inconsistent application and hinder effective compliance monitoring.

In summary, limitations in enforcement capacity and the integration of climate change considerations present additional barriers [based on prior conversation and inferred from the general scope of the laws]. Effective implementation of the existing regulations requires adequate resources for monitoring and enforcement across diverse geographical and sectoral contexts. Moreover, the proactive incorporation of climate change projections and adaptation measures within the core tenets of water sector regulations appears to be an area requiring further development to ensure long-term resilience and sustainability of water resources.

Forest and Agriculture Sector:

Laos' agricultural legal framework comprising the *Law on Livestock Production and Veterinary*, the *Law on Agriculture*, date 10 October 1998, and the *Decree on Agricultural Land*, date 27 February 2025—contains significant regulatory gaps that hinder climate change adaptation. These laws lack provisions addressing climate risks, leaving farmers exposed to droughts, floods, and shifting growing seasons. The livestock law limits adaptive

feeding systems; the agriculture law fails to promote resilient crops or efficient water use; and the land decree enforces fixed land-use categories, reducing flexibility in farming responses.

Institutional fragmentation further weakens implementation. Overlapping mandates across ministries lead to policy inconsistencies, and local authorities often lack the capacity to enforce land-use and sustainability standards. There are no legal requirements for climate risk assessments or mechanisms to ensure that farmers receive timely weather data, undermining informed decision-making.

Smallholder farmers receive little support under existing laws. There are no financial incentives, training programs, or legal recognition of indigenous knowledge, which is crucial for localized adaptation. Insecure land tenure under the land decree discourages long-term investment in resilience, and none of the laws address adaptive water management, increasing vulnerability during climate extremes.

Centralized decision-making slows local action, and the absence of sustainability incentives—such as those promoting soil health or carbon sequestration reveals a policy gap. Climate adaptation is still treated as peripheral, rather than central, to agricultural policy. Without reforms to modernize laws, empower local authorities, and support farmers, the sector will remain highly exposed to climate risks. A unified, climate-responsive legal framework is essential for building long-term resilience in Lao agriculture.

The regulatory landscape governing Lao PDR's forestry sector, informed by the "Law on Wildlife, date 30 August 2023", the "Law on Forestry, 13 June 2019", and the "Decree on Protected Areas, date 20 June 2023", reveals several key barriers and challenges that may impede effective and sustainable management of these crucial sectors.

A significant challenge lies in the decentralised nature of regulatory responsibilities and the potentially complex multi-level approval processes. For instance, the "Law on Wildlife" mandates registration of wild animals at the District Agriculture and Forestry Office, while trade and other activities require authorisations from varying levels within the Agriculture and Forestry sector, sometimes extending to the Ministry level. Similarly, the "Law on forestry" outlines intricate procedures for designating forest area, approving logging plans, and granting leases or concessions, often necessitating approvals from multiple administrative tiers (village, district, provincial, and national). This decentralisation, while aiming for localised management, risks fragmentation, inconsistencies in implementation, and increased bureaucratic burden if coordination mechanisms and information flows are not robust. The "Decree on Protected Area" further illustrates this with its four levels of Conservation Forests and varying approval authorities for conversion, demanding effective inter-agency and inter-level collaboration.

Another key barrier stems from the multiplicity of regulations and the potential for overlaps or ambiguities across different legal instruments. While each law addresses specific aspects (wildlife, general forestry, protected areas), the interconnectedness of these domains necessitates clear delineation and integration of their respective provisions. For example, the "Law on forestry" addresses the protection of forests which serve as habitats for wildlife governed by the "Law on Wildlife". Ensuring coherence in the application of regulations concerning land use, resource extraction, and conservation across these laws presents a considerable challenge. Furthermore, the frequent reference to "specific regulations" to be determined later indicates a reliance on future sub-legislation, which, if delayed or inconsistently formulated, can hinder the effective implementation of the overarching legal frameworks.

Enforcement and monitoring capacity represent a persistent challenge. The "Law on forestry" establishes various inspection organisations and outlines the rights and duties of forestry officers, while the "Decree on Protected Area" details the roles of Conservation Forest Management Offices in monitoring and preventing illegal activities. However, the effectiveness of these structures is contingent upon adequate resources, technical expertise, and inter-agency cooperation, which may be constrained in practice. The decree establishes three key zones within

these forests: the Totally Protected Zone (TPZ), where only management, research, and ecotourism activities are allowed, however, the TPZ also faces challenges, including potential conflicts with local communities who may rely on forest resources for their livelihoods, leading to risks of illegal encroachment if alternative income sources are not provided. While it effectively minimizes environmental degradation, its rigid restrictions require careful integration with community-based management and socio-economic development strategies to ensure both ecological integrity and local acceptance; the Controlled Use Zone, where local communities may harvest non-timber forest products (NTFPs), engage in sustainable agriculture, and use forest resources for family or village public use under strict guidelines; and the Buffer Zone, managed similarly to the Controlled Use Zone. Activities in all zones must align with approved Conservation Forest Management Plans, and any conversion, lease, or concession of conservation land requires formal approval and adherence to environmental mitigation measures. The decree emphasizes community participation, biodiversity conservation, and compliance with national and international laws and standards. The "Law on Wildlife" also emphasises reporting violations, suggesting a reliance on effective surveillance and responsiveness from relevant authorities. Limited capacity for robust monitoring and enforcement can undermine the intended outcomes of even well-designed regulations.

Finally, the integration of cross-cutting issues, such as climate change and socio-economic development, into the regulatory frameworks warrants attention. While the preambles of the "Law on forestry" and the "Decree on Protected Area" mention sustainable development and livelihoods, the extent to which specific regulations effectively address these aspects requires further scrutiny. For instance, ensuring the participation of local communities in forest management and benefit-sharing mechanisms are crucial for both conservation and local livelihoods but may face implementation challenges. Similarly, the explicit incorporation of climate change adaptation and mitigation strategies within the sector-specific regulations appears to be an evolving area.

In summary, while Lao PDR possesses legislative frameworks for the agriculture and forestry sector, achieving their intended goals of sustainable management and conservation is potentially hampered by complex decentralised governance structures, the need for greater regulatory coherence across different laws, limitations in enforcement capacity, and the ongoing integration of broader socio-economic and environmental considerations. Addressing these barriers through streamlined processes, clearer inter-agency coordination, capacity building, and the development of specific implementing regulations will be crucial for enhancing the effectiveness of the legal framework in these vital sectors.

Urban Development and Transport Sector:

The **Law on Urban Planning, date 28 December 2017** establishes a legal framework for urban development, including land use planning and infrastructure management within urban areas. This law outlines various aspects of urban planning such as the preparation of urban master plans, the control of construction activities, and the management of urban infrastructure. However, the document does not explicitly address climate change adaptation measures or the specific legislative hurdles that might impede their implementation within the urban planning context.

Similarly, the **Law on road, date 05 December 2016** focuses on the development, maintenance, and management of the national road network. It covers aspects like road classifications, road construction standards, and the management of road transport activities. While the transport sector is significantly impacted by climate change and plays a role in both mitigation and adaptation, this law does not contain explicit provisions that discuss the legislative barriers or challenges to achieving climate change adaptation within the transport sector.

The **Law on Water Way, 10 February 2023** primarily concerns the management and utilization of waterways, including navigation, infrastructure development, and environmental protection related to water resources. While climate change impacts water resources and water transport, this law does not specifically detail legislative barriers to climate change adaptation in the context of water transport or urban planning.

The **Law on Land, date 2 August 2019** focuses on land management, land use rights, and land administration processes. Although land use planning is a crucial element for climate change adaptation in both urban and potentially transport-related areas (e.g., green infrastructure, resilient transport routes), this law does not explicitly identify legislative barriers or challenges for climate change adaptation within these specific sectors.

Therefore, while these laws lay down the regulatory frameworks for urban planning and transport, they do not, based on the provided excerpts, specifically address the legislative barriers and challenges that hinder the achievement of climate change adaptation goals within these sectors. To identify such barriers and challenges, one would likely need to consult additional policies, strategies, or specific regulations that explicitly focus on adaptation of climate change within these domains.

Table 12: Gap Analysis of Laws, Regulations, and Policies in Lao PDR

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
Policy Area A: Climatic, Disaster and Environment			
A1. Decree on Climate Change, 2019			
1. Comprehensive framework for climate change action - Covers vulnerability assessment, adaptation, mitigation - Requires national/sectoral strategies	Lack of specific regulations for key sectors (agriculture, urban planning, transport) - No enforceable targets or rules	Develop sector-specific regulations with clear targets and enforcement mechanisms	- Relevant Ministries (MAF, MPWT etc.) - MoNRE
2. Climate change adaptation as key objective - Explicitly addresses climate impacts - Promotes green growth	No concrete mechanisms for mainstreaming adaptation - Lacks integration into planning/budgeting	Mandate climate adaptation in all sectoral planning and budgeting processes	- All government agencies - National/provincial authorities
3. Recognition of climate impacts - Lists effects on resources, ecosystems, economy, health	No standardized methodologies for assessments - No public access requirements	Establish guidelines for vulnerability assessments - Ensure public disclosure	- MoNRE - Research institutions
4. Greenhouse gas identification - Lists key GHGs (CO ₂ , CH ₄ etc.)	Lacks adaptation-specific actions/indicators - No priority sectors defined	Create adaptation action plans with measurable indicators - Prioritize vulnerable sectors	- Sectoral ministries - DCC/MoNRE
5. Institutional framework - Mentions national/sectoral/provincial plans	Unclear roles/responsibilities - Weak coordination	Clarify institutional roles - Strengthen coordination mechanisms	- All relevant ministries - Provincial/local authorities - Oversight bodies
A2. Law on disaster risk Management 2019			
1. Establishment of Disaster Management Committees (Articles 51-57): Multi-level committees for disaster planning and response, including climate-related hazards (e.g., floods, droughts).	- Limited explicit linkage to climate change scenarios in committee mandates. - Lack of technical capacity to address climate-specific risks (e.g., slow-onset droughts).	- Integrate climate projections into risk assessments. - Train committees on CCA tools (e.g., climate modeling, adaptive agriculture).	- NDMC/MLSW - MoNRE - Local Authorities
2. Disaster Risk Reduction (DRR) Measures (Articles 45-50): - Focus on infrastructure resilience, early warning systems, and public awareness.	- DRR measures often reactive (post-disaster) rather than proactive (climate adaptation). - Weak integration of ecosystem-based adaptation (EbA) approaches.	- Mainstream CCA into DRR policies (e.g., mangrove restoration for flood control). - Promote nature-based solutions (NbS) in infrastructure planning.	- MoNRE (Climate Change Dept.) - MPWT - NGOs/UNDP

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
3. Emergency Response and Relief (Articles 21-28): - Protocols for rapid response to disasters exacerbated by climate change (e.g., intensified storms).	- Relief systems not yet optimized for climate-induced displacement (e.g., long-term resettlement). - Limited focus on livelihood recovery in climate-vulnerable sectors (e.g., agriculture).	- Develop climate-adaptive relief protocols (e.g., heatwave shelters). - Link relief to long-term CCA programs (e.g., drought-resistant crops).	- Lao Red Cross - MAF - UN Agencies (WFP, FAO)
A3. Law on Meteorology and Hydrology			
1. Establishment of Meteorological and Hydrological Monitoring Systems (Articles 33-37): - Mandates the setup of stations to monitor weather (e.g., temperature, rainfall) and hydrological data (e.g., river levels, groundwater).	- Limited real-time data sharing for climate modeling. - Few stations in climate-vulnerable rural areas.	- Expand monitoring networks to climate-sensitive zones. - Integrate data with regional CCA platforms (e.g., ASEAN Climate Outlook).	- DMH/MoNRE - Provincial Authorities
2. Early Warning Systems for Disasters (Articles 44-47): - Requires development of early warning systems for floods, droughts, and storms using meteorological/hydrological data.	- Warnings often reactive; lack community-tailored CCA strategies. - Limited local capacity to interpret warnings.	- Link early warnings to CCA action plans (e.g., drought-resistant crops). - Train local committees on climate-risk communication.	- DMH - NDMC/MLSW - Lao Red Cross
A4. Law on Environmental Protection 2024			
1. Environmental Protection and Pollution Control (Articles 1-3, 16-17) Objectives: Prevent pollution, manage waste, and ensure clean air/water. Covers air, water, and soil pollution, hazardous materials, and waste management.	- Limited focus on climate-specific adaptation measures (e.g., resilience to extreme weather). - Weak enforcement mechanisms for industrial compliance.	- Integrate climate adaptation frameworks (e.g., early warning systems, infrastructure resilience). - Strengthen monitoring and penalties for non-compliance.	MoNRE, Local Governments.
2. Public Participation and Awareness (Articles 60-62). Objectives: Promote public involvement in environmental protection. Encourages education and stakeholder collaboration.	- Lack of structured public engagement in climate adaptation planning. - Limited tools for citizens to report violations or access data.	- Launch community-based programs (e.g., climate education, participatory monitoring). - Develop digital platforms for reporting and transparency.	NGOs, Community Groups, Ministry of Education.

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
3. Sustainable Resource Management (Articles 11-12, 24-25). Objectives: Sustainable use of natural resources (forests, water, biodiversity).	- Inadequate policies for ecosystem-based adaptation (e.g., reforestation, wetland conservation). - Overemphasis on reactive measures (e.g., waste disposal) over proactive conservation.	- Expand protected areas and incentivize sustainable practices (e.g., agroforestry). - Align with international standards (e.g., UN SDGs).	MoNRE, DoA-MAF, Private Sector.
Policy Area B. Water Sector			
B.1 Law on Water and Water Resource Management			
1. Integrated Water Resource Management (IWRM) Aims to regulate water use, allocation, and conservation. Ensures equitable access and sustainable use.	- Limited explicit mention of climate change impacts (e.g., droughts, floods) in water allocation. - Weak provisions for transboundary water management under climate variability.	- Incorporate climate resilience strategies into IWRM frameworks (e.g., adaptive water allocation). - Strengthen regional cooperation for shared water resources (e.g., Mekong River Commission).	MoNRE, PoNRE, DoNRE and local authority of community water user group
2. Pollution Control and Water Quality Standards. Sets penalties for water pollution and degradation.	- No clear linkage between water quality standards and climate-induced pollution (e.g., salinity intrusion). - Limited enforcement mechanisms for industrial compliance.	- Update water quality guidelines to address climate-related contaminants (e.g., heavy metals from erosion). - Enhance monitoring systems with real-time climate data integration.	- Department of Water Resources (DWR). - Dep of NRE Inspection
3. Community Participation and Traditional Knowledge. Encourages local involvement in water governance.	- Lack of formal integration of indigenous knowledge into climate adaptation planning. - Insufficient funding for grassroots initiatives.	- Establish community-based water management programs with climate adaptation training. - Secure climate finance (e.g., Green Climate Fund) for local projects.	- Village Water User Associations. - NGOs and International Partners (e.g., UNDP, GIZ).
B2. Aquatic animal and fishery management			
1. Sustainable Fisheries Management (Articles 5, 19, 23): Emphasizes conservation and sustainable use of aquatic resources.	Climate resilience measures are not explicitly addressed; lacks climate-responsive management practices.	Integrate climate risk assessments into fisheries management plans. Promote climate-smart aquaculture.	MAF/DLF
2. Aquatic Ecosystem Protection (Articles 6, 17, 24): Aims to protect habitats, spawning grounds, and biodiversity.	Limited mention of climate-induced ecosystem stress (e.g., temperature rise, water quality shifts).	Include ecosystem-based adaptation (EbA) practices and periodic climate impact monitoring in law enforcement.	MONRE/MAF, local authorities

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
3. Community Participation and Livelihoods (Articles 8, 21, 39): Promotes community-based fishery management and income generation.	Insufficient linkage to climate vulnerability of local livelihoods, e.g., fish stock decline due to drought.	Support climate-resilient livelihood alternatives and enhance early warning systems for communities.	Village Fishery Committees, MAF, international partners (e.g., FAO, WWF)
B.3. Law on Irrigation 2013			
1. Regulation of Water Resource Management (e.g., infrastructure like dams, canals, drainage systems). Objectives: Ensure efficient water distribution, prevent floods/droughts, and support agriculture.	Limited explicit mention of climate resilience (e.g., no specific provisions for extreme weather adaptation like intensified droughts or floods).	Integrate climate-resilient design standards (e.g., reinforced infrastructure, adaptive water storage).	MAF, MoNRE, PAFO/DAFO/PoN RE/DoNRE and village Authorities.
2. Roles and Responsibilities of Stakeholders (e.g., government agencies, users, and private entities in irrigation maintenance and operation). Objectives: Clarify accountability and promote participatory management.	Lack of clear guidelines for community-based adaptation or decentralized decision-making to address local climate impacts.	Strengthen community engagement programs and local capacity-building for climate adaptation.	PAFO/DAFO, Farmer Cooperatives, Private Sector.
3. Penalties for Violations (e.g., fines for damaging infrastructure or unauthorized water use). Objectives: Deter misuse and ensure compliance.	Penalties focus on immediate infractions but lack incentives for long-term sustainable practices (e.g., water conservation during droughts).	Introduce rewards for climate-smart practices (e.g., rainwater harvesting, efficient irrigation).	Judiciary, Local Enforcement Agencies, DoNRE.
B.4 Law on Dam Safety 2022			
1. Dam Classification & Safety Standards (Articles 9-10) - Classifies dams by size/risk (e.g., large/small). - Sets safety standards for design, construction, and operation.	- Limited explicit integration of climate resilience (e.g., extreme rainfall, flooding) in safety standards. - No mention of dynamic risk reassessment due to climate change.	- Update safety standards to include climate projections (e.g., higher spillway capacity). - Mandate regular risk reviews under climate scenarios.	MoNRE/MEM; Dam Safety Committees.
2. Emergency Preparedness (Articles 46-48) - Requires dam operators to develop emergency response plans. - Includes protocols for warning systems and evacuations.	- Plans may lack climate-specific triggers (e.g., intensified storms). - Limited cross-sector coordination for downstream communities.	- Integrate climate data into early warning systems. - Conduct joint drills with local disaster agencies.	NDMC/MLSW; Local Authorities; Dam Operators.

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
3. Feasibility Study-Environmental & Social Safeguards (Articles 19-19 & 38-39) - Mandates environmental impact assessments (EIAs) and community safeguards. - Addresses water release impacts.	- EIAs may not fully assess long-term climate risks (e.g., sedimentation changes). - Weak community participation in adaptation planning.	- Strengthen EIAs with climate vulnerability studies. - Involve communities in adaptive water management.	MoNRE; MEM/MAF; Community Reps.
B.5 Decree on Wetland 2023			
1. Wetland Conservation and Management (Articles 1-2): Defines wetlands and their ecological importance, emphasizing protection of water resources, biodiversity, and ecosystem services.	Limited explicit linkage to climate change adaptation (e.g., no mention of wetlands as carbon sinks or buffers against floods/droughts).	Integrate climate resilience metrics (e.g., flood mitigation capacity, carbon storage) into wetland management plans.	MoNRE, Local Governments, PoNRE/DoNRE
2. Roles of Stakeholders (Articles 4-7): Assigns duties to authorities and communities for wetland monitoring, pollution control, and sustainable use.	Lack of clear enforcement mechanisms or incentives for community participation in climate adaptation (e.g., livelihood alternatives to reduce wetland exploitation).	Strengthen community engagement through education and incentives (e.g., payments for ecosystem services).	Local Communities, NGOs, MAF
3. Restoration and Penalties (Articles 13, 22, 49): Outlines wetland restoration measures and penalties for violations (e.g., illegal dumping, land reclamation).	Restoration focuses on ecological recovery but lacks climate adaptation targets (e.g., restoring wetlands to enhance regional climate resilience).	Align restoration projects with climate adaptation goals (e.g., prioritize wetlands in flood-prone areas).	MoNRE, Judiciary, PoNRE/DoNRE
B.6 Law on Water Way 2023			
1. Regulation of Waterway Transport (Articles 16-20) - Governs waterway traffic, safety, and environmental protection for vessels.	- Lack of explicit provisions for climate-induced risks (e.g., flooding, extreme weather resilience). - Limited integration of adaptive infrastructure (e.g., flood-resistant docks).	- Incorporate climate resilience standards for vessels and infrastructure. - Mandate risk assessments for extreme weather events.	MPWT; Waterway Authorities
2. Waterway Infrastructure Development (Articles 65-71) - Establishes waterway zones (e.g., navigation, loading areas) and maintenance protocols.	- Infrastructure design may not account for rising water levels or erosion. - No clear guidelines for eco-friendly materials or green infrastructure.	- Update zoning laws to include climate adaptation measures. - Promote nature-based solutions (e.g., wetlands for flood mitigation).	MPWT/MoNRE; Local Governments
3. Water Transport and Emergency Response (Articles 58-64) - Addresses accidents and disaster response in waterways.	- Weak provisions for climate-related disasters (e.g., oil spills during floods). - Insufficient funding for emergency preparedness.	- Strengthen contingency plans for climate-linked disasters. - Allocate funds for adaptive response systems.	MPWT/MoNRE; NDMC/MLSW

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
Policy Area C. Agriculture and Forestry			
C.1. Law on Agriculture, 1998			
1. Agricultural Land Use & Management: - Defines and categorizes agricultural land (arable, livestock) - Prohibits changing land use without permission - Mandates soil improvement and sustainable use - Aims to allocate land for stable production and reduce slash-and-burn agriculture.	- The law focuses on traditional land management and productivity enhancement but lacks specific provisions for adapting land use to climate change impacts like increased droughts, floods, or soil degradation exacerbated by climate variability⁵. - No explicit mention of promoting climate-resilient land management practices.	- Integrate climate change vulnerability assessments into land use planning. - Promote climate-resilient soil management techniques (e.g., conservation agriculture, agroforestry). - Update regulations for land use change considering future climate scenarios.	- MAF - MoNRE
2. Irrigation & Water Management: - Defines irrigation as supplying water for agriculture via dams, weirs, pumping, canals etc. - Recognizes the need for irrigation due to climate variability (droughts/floods). - Outlines management structures for small, medium, and large scale irrigation based on user/state involvement. - Establishes rules regarding water flow and access rights between land plots.	- While acknowledging natural water variability, the law doesn't explicitly address the increasing intensity and frequency of water-related climate risks (e.g., severe droughts, intense rainfall, altered river flows). - Limited focus on water-use efficiency and conservation measures needed for climate adaptation. - Doesn't explicitly promote climate-resilient irrigation infrastructure or techniques.	- Incorporate climate projections into irrigation planning and design. - Promote water-saving irrigation technologies and practices. - Strengthen participatory water management considering climate risks. - Review water allocation rules under changing climate conditions.	- MAF - DWRM/MoNRE - Government (for larger schemes)
3. Promotion of Agricultural Production & Technology: - Aims to ensure food security, produce commodities, and supply raw materials for industry. - Encourages investment (domestic/foreign) in modernizing agriculture. - Supports the use of improved seeds/breeds suitable for local conditions. - Provides for technical assistance from MAF.	- The focus is on general modernization and productivity, without specific emphasis on climate-resilient technologies or climate-smart agriculture (CSA) practices. - Risk of promoting technologies that may not be suitable under future climate conditions. - Lack of mechanisms to specifically screen or promote technologies for their adaptation benefits.	- Integrate climate resilience criteria into agricultural R&D and extension programs. - Promote climate-smart agricultural practices (e.g., drought-tolerant varieties, integrated pest management adapted to changing conditions). - Support climate information services for farmers.	- MAF - Investors (domestic/foreign) - MOIC - MoES/successor

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
C.2. Law on Livestock and Veterinary, 2016			
1. Animal Health & Disease Control: - Defines veterinary science scope including animal health checks, disease diagnosis/treatment, prevention and control of animal diseases (including zoonotic), and food safety inspection. - Defines epidemic animal diseases and related concepts (risk, assessment, control zones, buffer zones). - Aims to maintain animal health, control disease spread and ensure food safety throughout the production chain.	- While robust on general disease control, the law doesn't explicitly link changing disease patterns (vector distribution, emergence of new diseases) to climate change. - Lacks specific strategies for managing climate-induced animal health risks (e.g., heat stress, waterborne diseases after floods). - Surveillance systems might need strengthening to detect climate-sensitive diseases early.	- Integrate climate change projections into animal disease surveillance and risk assessments. - Develop specific protocols for managing heat stress and other climate-related health issues in livestock. - Enhance biosecurity measures considering changing environmental conditions favoring disease vectors. - Strengthen early warning systems for climate-sensitive animal diseases.	- MAF - DLF (or equivalent) - (Veterinarians, Animal Nurses, Village Vets) - Research/ diagnostic laboratories
2. Breed Development & Management: - Defines and regulates the registration, identification, conservation, improvement, and expansion of animal breeds. - Includes management of genetic resources (semen, eggs, embryos). - Covers registration of breeding animals and herd books. - Aims to improve animal quality and productivity sustainably, including conserving valuable native breeds.	- The focus is primarily on productivity and conserving existing breeds, with less explicit emphasis on selecting or developing breeds specifically for resilience to climate change (e.g., heat tolerance, drought resistance, ability to thrive on lower-quality feed). - Lack of specific incentives or programs mentioned for promoting climate-adapted breeds.	- Incorporate climate resilience traits (heat tolerance, disease resistance, feed efficiency under stress) into national breeding programs and selection criteria. - Promote research and conservation of indigenous breeds known for local adaptation. - Support farmers in accessing and managing climate-resilient breeds.	- MAF - <DLF(or equivalent) - Individuals /entities involved in breed development
3. Animal Feed & Nutrition: - Covers the development and management of animal feed and forage crops. - Includes regulations for registration, production, distribution, import/export, quality control, and safety of feed. - Mandates feed analysis for nutritional content and contaminants. - Aims to ensure efficient production and use of high-quality, safe animal feed.	- While addressing feed quality and safety, the law doesn't explicitly tackle climate change impacts on feed resources, such as reduced pasture availability due to drought, changes in forage quality, or impacts on feed crop yields. - Limited focus on promoting climate-resilient feed sources or strategies for managing feed scarcity during extreme weather events. - Does not explicitly link land use for feed production (Art 12) with climate resilience.	- Promote the cultivation and use of drought-resistant forage crops and alternative feed resources. - Develop strategies for feed conservation and storage to buffer against climate variability. - Integrate climate considerations into land use planning for feed production. - Support research on optimizing animal diets using locally available, climate-resilient resources.	- MAF - DLF (or equivalent) - Individuals/ entities producing/ selling feed - Research/testing laboratories

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
C.3 Decree on Agriculture land 2025			
1. Land Use Planning & Zoning: - Defines specific target uses for agricultural land (paddy, short/long-term crops, livestock/fishery, irrigation, research). - Mandates agricultural land use planning at village, district, and provincial levels. - Requires mapping based on surveys (soil, topography, current use). - Aims for land use to be efficient, sustainable, and aligned with national/local development plans.	- While emphasizing suitability based on current characteristics (soil, topography), the planning process doesn't explicitly mandate the incorporation of future climate change projections (e.g., shifts in rainfall patterns, temperature increases, extreme event risks) into land suitability assessments and zoning. - The concept of "sustainable agriculture" is mentioned, but specific climate adaptation criteria for planning are not detailed.	- Integrate climate change vulnerability assessments and future climate scenarios into the agricultural land use planning process at all levels (village, district, province). - Develop specific criteria for climate-resilient land use allocation (e.g., identifying areas suitable for drought-tolerant crops, avoiding high-risk flood zones for certain activities). - Update land suitability mapping (Art 18) to include climate resilience factors.	- MAF - MONRE - PAFO/DAFO/PoNRE/DoNRE - Provincial People's Councils. - Local communities/people
2. Land Protection & Conservation: - Mandates protection of specific priority areas (irrigated land, fertile soil, unique characteristic zones, research land). - Requires maintaining soil quality and preventing degradation, erosion, and chemical contamination. - Establishes reserve zones, including buffer zones along waterways. - Includes protecting biodiversity within agricultural landscapes. - Aims to prevent loss of agricultural land and maintain its ecological functions.	- The decree addresses erosion and soil degradation, but doesn't explicitly link the increased risks of these issues to climate change impacts (e.g., more intense rainfall causing erosion, drought degrading soil). - Protection measures (e.g., buffer zones) are defined by fixed distances, potentially not accounting for increased flood risks or altered hydrology under climate change. - Biodiversity protection doesn't explicitly mention adapting to climate-induced habitat changes.	- Strengthen soil erosion control measures (Art 27) with techniques specifically designed for increased rainfall intensity. - Review and potentially adjust buffer zone requirements (Art 29, 31) based on climate change-induced flood risk assessments. - Integrate climate adaptation considerations into biodiversity conservation plans within agricultural areas (Art 33). - Promote conservation agriculture practices that enhance soil resilience to climate stresses.	- MAF/MONRE. - Local authorities - Individuals, legal entities, organizations using the land - Relevant sector agencies for specific reserves (e.g., MOICT for underground cables)
3. Land Development & Improvement: - Focuses on improving land productivity and soil health. - Promotes soil restoration, improvement techniques, crop rotation, and appropriate fertilizer use (encouraging organic options).	- While promoting soil health, the link between healthy soils and climate resilience (e.g., enhanced water retention, carbon sequestration) is not explicitly highlighted as a co-benefit. - Recommended practices (crop rotation, fertilizer use) are based on general	- Explicitly promote soil health improvement techniques (Art 37, 38, 39) for their climate adaptation co-benefits (water retention, resilience to extremes). - Develop and disseminate climate-smart agriculture (CSA) guidelines for	- MAF - Local authorities - Other relevant sectors/organizations

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
- Involves creating farmer models and "soil doctor" volunteers for knowledge transfer. - Aims to enhance land value and ensure sustainable, high-yield production.	agronomy, without specific guidance on adapting these practices to changing climate conditions (e.g., selecting rotations suitable for altered seasons, adjusting fertilizer management for drought/flood periods).	crop rotation, water management, and fertilizer use under changing climate patterns. - Equip farmer models and "soil doctors" (Art 40) with knowledge and tools specifically related to climate change adaptation in land management.	- Individuals, legal entities, organizations using fertilizer
C.4. Law on Forestry, 2019			
Forest Classification & Management (Articles 14-17, 19, 47-49) - Classifies forests into Protection, Conservation, Production. - Sets management goals (e.g., watershed protection, biodiversity, sustainable timber).	No explicit climate vulnerability assessments or adaptation criteria in forest zoning/plans.	Integrate climate resilience into forest zoning; mandate adaptation measures in management plans.	MAF, MONRE, Provincial/District Authorities, National Assembly.
Forest Development & Regeneration (Articles 54-60) - Promotes reforestation and plantations on degraded land. - Incentivizes tree/NTFP planting.	Lacks guidelines for climate-resilient species or diversification against pests/droughts.	Prioritize native, climate-adapted species; link incentives to adaptation co-benefits (e.g., erosion control).	MAF, PAFO/DAFO, Communities, Private Sector.
Sustainable Utilization & Funding (Articles 61-65, 90, 103, 130-132) - Regulates forest use; introduces PFES and carbon trading. - Establishes Forest Protection Fund (FPF).	PFES/carbon trading lacks operational details for adaptation benefits. FPF use not explicitly tied to adaptation.	Develop PFES/carbon guidelines valuing adaptation; earmark FPF for resilience projects (e.g., monitoring, community-based adaptation).	MAF, Ministry of Finance, Local Authorities, Private Investors.
C.5. Law on Wildlife Management (amended), 2023			
1. Wildlife Classification & Regulated Use - Classifies species into Prohibited (I), Managed (II), General (III). - Regulates hunting, trade, and use based on conservation status.	- Species listing lacks climate vulnerability criteria. - Hunting quotas/seasons don't account for climate-driven shifts in populations.	- Integrate climate vulnerability into species listing reviews. - Adjust hunting rules based on climate impacts.	MAF, PAFO/DAFO, CITES, Government
2. Habitat Management & Species Conservation - Designates conservation areas, rehab centers.	- Habitat plans lack climate resilience/connectivity. - Release programs ignore climate suitability of sites.	- Prioritize climate-resilient habitats. - Assess climate suitability for animal releases.	MAF, PAFO/DAFO, Local Authorities, Researchers

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
- Mandates surveys, research, and public awareness.			
3. Mitigating Development Impacts & Conflict Resolution - Requires projects to follow Mitigation Hierarchy (avoid, minimize, restore, offset). - Addresses human-wildlife conflicts.	- No climate risk assessment for offsets/restoration. - Conflict measures don't anticipate climate-driven shifts.	- Include climate in impact assessments. - Proactively plan for climate-aggravated conflicts.	MAF, MoNRE, MPI, Developers, Communities
4. Disease Prevention & Control - Sets disease surveillance, outbreak controls, and zoonotic coordination.	- No link to climate-driven disease spread. - Surveillance lacks focus on climate-sensitive pathogens.	- Monitor climate-linked diseases. - Strengthen MAF-Health sector coordination.	MAF, MoH, Local Authorities
C.6. Decree on Protected Areas, 2023			
1. PA System Designation - 4 levels & 6 categories of PAs - Procedures for designation/changes	- No climate resilience criteria in PA selection - Future climate impacts not considered	- Add climate resilience to PA criteria - Use climate modeling in planning	Government, MAF, MONRE, Local Authorities
2. PA Management Planning - Requires surveys & management plans - Establishes 3 zones (TPZ, CUZ, BZ)	- No climate adaptation in plans - No adaptive management framework	- Add climate strategies to plans - Create climate monitoring systems	PA Management Offices/DoF, MAF, Local Communities
3. Development Impact Mitigation - Mitigation Hierarchy (avoid-minimize-restore-offset) - No-Net-Loss requirement	- Climate risks to offsets not assessed - Cumulative climate impacts ignored	- Climate-proof offset projects - Include climate in impact assessments	MAF, MONRE, Developers, Local Govt
4. Livelihoods & Benefits - Supports sustainable livelihoods - Benefit sharing mechanisms	- No climate resilience in programs - Benefits not earmarked for adaptation	- Promote climate-smart livelihoods - Link benefits to adaptation projects	Local Authorities, Communities, MAF
Policy Areas D. Urban Development and Transport Sector			
D.1. Law on Urban Planning (amended), 2017			
1. Planning Principles - Sustainable urban development - Environmental protection	- No explicit climate change focus - Reactive protection vs proactive resilience	- Add climate resilience to core objectives - Define climate hazards for planning	MPWT, MONRE, National Assembly
2. Land Use & Zoning - Land allocation - Risk zone mapping - Green space planning	- Risk zones use historical data - Green spaces not optimized for climate benefits	- Use climate projections for hazard maps - Set climate-resilient zoning standards	MPWT, MONRE, MAF, Local Authorities

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
3. Infrastructure: - Technical/social infrastructure - Safety standards	- Standards based on past climate - Limited nature-based solutions	- Update codes for climate resilience - Mandate nature-based solutions	MPWT, MEM, Utilities, MONRE
4. EIA & Risk Assessment - Disaster risk analysis - Environmental impacts	- Climate projections not required - Focus on project impacts not climate risks	- Require climate risk assessments - Include adaptation measures in EIAs	MONRE, MPWT, Disaster Management
D.2.			
Article 1 (Purpose) <i>Aims for sustainable transport with minimal environmental impact.</i>	No explicit mention of climate adaptation or resilience (e.g., flood-resistant roads).	Explicitly integrate climate adaptation objectives (e.g., resilient infrastructure).	MPWT, MoNRE
Article 5 (Principles) <i>Includes environmental protection, safety, and sector coordination.</i>	"Environmental protection" is too broad; no direct climate adaptation principle.	Add "climate resilience" as a core principle. Require climate vulnerability assessments in planning.	MPWT, MPI, MoNRE, Local Authorities
Article 6 (Obligations) <i>Transport operators must protect roads and the environment.</i>	Focuses on vehicle-related damage, not climate resilience (e.g., erosion, flooding).	Clarify that "protecting roads" includes climate adaptation measures (e.g., drainage maintenance).	Transport Operators, MPWT
Article 3 & 72 (Emergency Transport) <i>Defines emergency response for natural disasters.</i>	Reactive (disaster response), not proactive (resilient design).	Require climate projections in planning to reduce disaster risks (e.g., flood-proof roads).	MPWT, Disaster Management Committees
Article 15 & Infrastructure Standards <i>Sets vehicle standards; implies infrastructure rules.</i>	No climate-resilient design standards (e.g., flood-resistant bridges, heat-tolerant materials).	Develop climate-resilient infrastructure standards (e.g., for floods, extreme heat).	MPWT, Construction Sector, Engineering Bodies
D.3. Law on Road (amended) 2016			
1. Define & regulate road works (planning, design, construction, maintenance, inspection). Covers road types (National, Provincial, District, etc.).	Law emphasizes quality, safety, and environmental protection but lacks explicit climate risk assessments (e.g., flooding, landslides, heat) in planning, design, and maintenance. No specific climate-resilient standards.	Integrate climate risk assessments into planning & design (Articles 1, 4, 5, 30, 31). Develop climate-resilient technical standards and specifications.	MPWT (lead), National Standards Council, current Project Owners (ministries/local gov.), Consultants, Contractors.
2. Promote quality, safety & efficiency (adherence to technical standards, year-round traffic).	Current standards may not account for future climate impacts (e.g., drainage, slopes, bridges). Emergency repairs exist, but proactive adaptation is missing.	Update technical standards for climate-resilient materials/designs (e.g., improved drainage, slope stabilization, heat-resistant pavement). Mandate	MPWT, National Standards Council, University, Current Project Owners,

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
		climate risk screening for existing roads (Articles 3(15), 4).	Consultants, Contractors,
3. Environmental protection (pollution prevention, tree planting).	Focuses on immediate construction impacts, not long-term climate resilience. No explicit link between environmental measures and adaptation.	Strengthen climate adaptation links (Articles 1, 4, 5, 18). Promote nature-based solutions (e.g., slope-stabilizing vegetation, watershed management). Enhance runoff management for extreme rainfall.	MPWT, MONRE (environmental oversight), Project Owners, Local Gov., Consultants, Contractors.
4. Encourage investment & participation (public/private/PPP, local contractor development, public engagement).	No incentives for climate-resilient investments. Risk of cost-cutting reducing resilience. Public participation lacks climate risk awareness.	Add climate resilience criteria in PPP/concession evaluations (Article 4). Create financing incentives for adaptation. Strengthen public/local gov. engagement on climate risks in planning.	MPWT, MPI (investment), MOF (funding), Private Investors, Local Gov., Public.

6.2 Sectoral Strategies Review & Gap analysis

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
Agriculture and Forestry			
A1. 5-year development plan for agriculture and forestry (2021-2025)			
1. Climate-Resilient Technologies Scale drought/flood-tolerant seeds, mechanization, and cost-effective practices to enhance smallholder adaptation.	Limited pathways for localized technology dissemination; weak metrics on adaptive capacity gains.	Strengthen farmer-research-extension linkages for context-specific solutions. Monitor adoption/impact via participatory systems.	MAF (NAFRI, DALaM, DLF); PAFO/DAFO; CGIAR/ASEAN partners; Farmer organizations.
2. Disaster Risk Reduction (DRR) Integrate early warning systems, contingency plans, and "build back better" approaches for floods/droughts/pests.	Fragmented early warning systems; reactive (vs. proactive) recovery funding.	Localize multi-hazard early warnings with clear response protocols. Mainstream resilience into post-disaster recovery.	MAF; MONRE (hydromet); National Disaster Committees; UNDP/FAO; Local authorities.
3. Sustainable Forestry & REDD+ Rehabilitate degraded forests (70% cover target), promote agroforestry, and leverage REDD+ for emissions reduction/biodiversity.	Low community participation in reforestation; weak benefit-sharing from carbon credits.	Scale participatory forest management (PFM) and agroforestry NTFP value chains. Track adaptation co-benefits (e.g., watershed protection).	MAF (DoF); MONRE; REDD+ partners (GCF, WB); Village authorities.
4. Climate-Smart Infrastructure Modernize irrigation (454,800 ha target), promote GAP/Organic Agriculture, and strengthen land/water governance.	Irrigation inefficiencies; low adoption of climate-smart practices due to cost/market barriers.	Rehabilitate irrigation for water efficiency. Incentivize sustainable practices (CA, OA) via subsidies/market access.	MAF (Irrigation Dept.); MONRE; Private sector; Water user associations.
5. Research & Capacity Building Prioritize climate-resilient crop/livestock R&D and strengthen extension services for knowledge transfer.	Research-extension disconnect; underfunded adaptation-focused training.	Co-design research with farmers. Train extension staff/village technicians on adaptation tools (ICT, farmer networks).	NAFRI; Universities; ASEAN Climate Resilience Network; NGOs (e.g., CARE).

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
A2. Lao Forest Strategy 2035 and vision 2050			
1. Reducing Emissions & Carbon Credits (REDD+): Implement REDD+ framework, including establishing reference levels, monitoring systems, and safeguards. Develop carbon credit projects and engage in carbon trading (e.g., with World Bank in 6 Northern provinces). Target: Reduce 55 million tCO ₂ e (40m from avoided deforestation, 15m from restoration/afforestation).	The strategy focuses heavily on mitigation (reducing emissions) through REDD+. While successful mitigation contributes to global adaptation efforts, the direct integration of adaptation measures within the REDD+ framework or using carbon revenue specifically for local adaptation actions appears less explicitly detailed. The link between carbon finance and funding on-the-ground adaptation projects needs clearer articulation.	Explicitly link REDD+ revenue streams (carbon credits) to fund specific climate adaptation projects in forestry and agriculture sectors at the local level. Develop clear benefit-sharing mechanisms that prioritize adaptation needs alongside mitigation efforts. Strengthen monitoring to include adaptation co-benefits.	MAF, MONRE (implied for climate), WB, Local Gov.
2. Sustainable Livelihoods & Reducing Forest Pressure: Improve livelihoods of forest-dependent communities by allocating land, promoting stable occupations, and supporting sustainable production (agriculture, NTFPs, plantations) to reduce poverty and forest encroachment (e.g., shifting cultivation).	While promoting alternative livelihoods is crucial, the strategy could more strongly emphasize climate-resilient agricultural practices and NTFP value chains. The specific vulnerabilities of these communities to climate change impacts (droughts, floods affecting crops/NTFPs) are not explicitly assessed within this section, potentially leaving adaptation needs unaddressed.	Integrate climate vulnerability assessments into livelihood development planning for forest communities. Promote climate-smart agriculture techniques and diversification of income sources resilient to climate change (e.g., drought-resistant crops, adapted NTFP management). Provide access to climate information and early warning systems.	MAF, Local Gov., CSOs, Private Sector
3. Forest Protection for Environmental Services: Manage and protect Protection Forests (8.2M ha) and Conservation Forests (4.7M ha) to safeguard water sources, prevent soil erosion, conserve biodiversity, and mitigate natural disasters.	The objectives clearly contribute to ecosystem-based adaptation (EbA). However, the strategy could more explicitly frame these protection activities as climate adaptation measures. It lacks detail on how management plans for these forests will specifically incorporate climate change projections (e.g., adapting to changes in rainfall patterns, fire risk, pest outbreaks).	Develop climate-informed management plans for Protection and Conservation Forests. Integrate climate change scenarios into risk assessments (fire, pests, erosion). Prioritize restoration efforts in areas critical for water regulation and biodiversity under changing climate conditions. Monitor ecosystem health indicators relevant to climate resilience.	MAF (DOF), PONRE/MONRE (implied), Local Gov.

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
4. Reforestation and Restoration: Restore degraded forests (target 1.3M ha) and promote afforestation (target 0.5M ha), including for environmental protection (0.1M ha) and commercial purposes (0.4M ha).	Restoration goals contribute to adaptation by enhancing ecosystem services. However, the selection of species for reforestation/afforestation needs explicit consideration of future climate suitability. Relying heavily on a few commercial species (e.g., rubber, eucalyptus mentioned in past achievements) might increase vulnerability if those species are not climate-resilient. The strategy mentions developing guidelines but specifics on climate resilience aren't detailed.	Prioritize native and climate-resilient species in reforestation and restoration plans. Promote mixed-species plantations to enhance biodiversity and resilience. Integrate climate suitability modelling into site and species selection. Ensure restoration plans consider landscape connectivity to facilitate species migration under climate change.	MAF (DOF), Private Sector, Local Gov., Research Inst.
A.3 National REDD+ strategy			
1. Programme 1: Development of sustainable agriculture in coordination with forest protection. Aims to address forest clearance for agriculture by enhancing policy implementation, expanding forest landscape management/land use planning, developing diverse livelihood models, and improving monitoring.	This programme directly links agriculture and forestry, which is positive for integration. However, the focus is primarily on reducing deforestation (mitigation) and improving livelihoods generally. Explicit integration of climate adaptation objectives (e.g., promoting climate-resilient crops/systems, assessing climate risks to agriculture in forest landscapes) is not stated as a core objective or guiding principle within the programme's description.	Integrate climate vulnerability assessments into land use planning for agricultural expansion. Promote climate-smart and climate-resilient agricultural practices specifically within project activities. Ensure livelihood models explicitly consider climate change impacts and build adaptive capacity. Monitor adaptation co-benefits alongside emission reductions.	MAF, NRT, MONRE (implied), Local Gov., CSOs, Private Sector
2. Programme 5: Stabilize uncontrolled shifting cultivation by promoting sedentary agriculture production and controlling forest fires. Aims to address forest degradation from shifting cultivation/fires through policy implementation, defining forest boundaries, developing livelihood alternatives (incl. ecotourism), monitoring, and awareness-raising.	Stabilizing shifting cultivation and promoting sedentary agriculture offers significant potential for adaptation co-benefits (e.g., reduced vulnerability to drought, improved food security). However, the strategy frames this mainly through a deforestation/degradation lens. The need for promoted agricultural systems and livelihood alternatives to be resilient to climate change	Ensure promoted sedentary agriculture systems are climate-resilient (e.g., water management, drought/pest resistant varieties). Integrate climate change awareness into public campaigns alongside fire prevention and resource use. Develop climate-resilient ecotourism models. Link fire control systems with climate-related	MAF, NRT-National REDD+ Taskforce, MONRE (implied), Local Gov., CSOs

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
	is not explicitly highlighted as a key consideration in the programme objectives.	early warning systems for increased fire risk periods.	
3. Programme 2: Promotion of commercial tree plantation and forest restoration. Aims to manage plantation development, enhance restoration efforts according to targets, delineate areas, improve technical guidelines, and manage information systems, addressing unlawful development leading to deforestation/degradation.	Forest restoration and appropriate tree plantations can significantly enhance ecosystem-based adaptation (e.g., watershed protection, biodiversity corridors, soil health). The strategy focuses on meeting targets and technical standards for mitigation. The gap lies in the lack of explicit criteria for selecting species and restoration approaches based on future climate resilience and maximizing adaptation co-benefits alongside carbon sequestration.	Incorporate climate change projections and species suitability analyses into plantation and restoration planning. Prioritize native, climate-resilient species mixes. Design restoration projects to specifically enhance climate adaptation services (e.g., water regulation, erosion control in vulnerable areas). Monitor adaptation outcomes (e.g., water quality, biodiversity) alongside carbon stock changes.	MAF, NRT, Local Gov., Private Sector, Research Inst.
4. Social Safeguards & Benefit Sharing: Requirement to comply with social/environmental safeguards (UNFCCC Cancun Safeguards) and develop a Safeguards Information System (SIS). Need to finalize benefit-sharing mechanisms, ensuring transparency, fairness, and efficiency.	Safeguards and fair benefit-sharing are crucial for the social sustainability of REDD+. While existing frameworks are deemed adequate for social safeguards, there is a gap in explicitly linking these mechanisms to enhancing community climate resilience as a specific outcome. Benefit-sharing discussions focus on fairness/efficiency, but not explicitly on using benefits to fund local adaptation actions or prioritize vulnerable groups facing climate impacts.	Design the SIS to monitor how REDD+ activities affect community vulnerability (precisely females and ethnic groups vulnerability) and adaptive capacity. Ensure grievance mechanisms can address climate-related concerns linked to REDD+ activities. Structure benefit-sharing mechanisms to allow communities to invest REDD+ income in local climate adaptation priorities (e.g., water storage, resilient agriculture inputs, diversification).	MAF, NRTF, TWGs (Benefit Sharing, Safeguards), DOF, Local Gov, Women Union, Ethnic department of the Lao Front for National Development
A.4. Green and Sustainable Agriculture Framework to 2030			
1. Overall Goal 1: Adaptable to Climate Change: One of the four overall goals by 2030 is for agriculture to be "adaptable to climate change" alongside goals for economic	While listing climate change adaptation as an overall goal is important, the strategy lacks specific, measurable adaptation targets or	Develop specific, measurable adaptation targets and indicators for key agricultural sub-sectors (crops,	MAF, MPI, MONRE (implied), Local Gov.

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
growth, food security/nutrition, and competitiveness.	indicators integrated across its programs. The link between achieving this goal and specific actions within the food production and commodity production programs is not consistently explicit. Mainstreaming appears more as an overarching aim than a fully integrated operational principle throughout the detailed measures. Integration with forestry for adaptation is not mentioned in this high-level goal.	livestock, fisheries). Integrate climate vulnerability assessments and adaptation criteria into the planning and evaluation of all food security and commodity production programs. Explicitly link agricultural adaptation planning with forestry sector strategies (e.g., agroforestry, watershed management for resilience).	
2. Measure 3.2.1.1 (4): Prevention and Solution of Impacts from Natural Disaster: Focuses on integrating disaster management into plans, developing Disaster Risk Reduction (DRR) workplans, mapping risk areas, improving infrastructure (water gates, reservoirs), using climate-resilient seeds, and promoting local water storage.	This section outlines concrete adaptation measures related to hydro-meteorological disasters (floods, droughts) and partially addresses pest/disease outbreaks linked to climate. However, the focus is largely reactive (disaster management) and infrastructure-based. It could be strengthened by incorporating proactive vulnerability reduction strategies, ecosystem-based approaches (linking to forestry/watershed management), and addressing slow-onset climate impacts beyond immediate disasters. The integration with forestry for DRR/Adaptation is minimal in the description.	Enhance focus on proactive vulnerability reduction alongside disaster management. Promote ecosystem-based adaptation measures (e.g., agroforestry, conservation agriculture, watershed restoration) in coordination with the forestry sector. Integrate climate projections into infrastructure design and risk mapping. Develop strategies for slow-onset climate impacts (e.g., temperature rise effects on crops/livestock).	MAF, MONRE (implied for environment/disasters), MPWT (implied for infrastructure), Local Gov.
3. Measure 3.2.1.1 (8): Research - Climate Change Adaptation: Research focus area includes identifying techniques and technologies for agriculture and forestry production to adapt to climate change. Specific projects include researching/developing climate-resilient rice	Identifying research on climate adaptation is crucial. However, the strategy focuses primarily on crop varieties and techniques. Gaps include the need for broader research covering climate impacts on livestock, fisheries, soil health, pests/diseases under	Broaden the research agenda to include climate impacts and adaptation options for livestock, fisheries, soil management, and pest/disease dynamics. Strengthen research on the socio-economic dimensions of	MAF (incl. NAFRI - implied), NUOL (implied), International Partners

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
and food crop varieties (flood, drought, cold resistant) and associated appropriate/water-saving production techniques.	changing climate, and the socio-economic aspects of adaptation for farmers. The link between agriculture and forestry adaptation research mentioned at the area level lacks specific project examples within the ADS document itself.	adaptation, including farmer decision-making and institutional support needs. Foster joint research programs between agriculture and forestry institutions specifically on integrated adaptation strategies (e.g., resilient farming systems in forest landscapes).	
4. Measure 3.2.1.1 (5): Clean Agriculture Production and Food Safety: Promoting clean agriculture (GAP, OA) for sustainability and safety. This involves developing standards, model farms, certification systems, and managing inputs (fertilizers, pesticides).	Clean/sustainable agriculture practices (GAP, OA) often have adaptation co-benefits (e.g., improved soil health enhances drought resilience, reduced chemical use protects biodiversity which supports ecosystem services). However, the strategy presents these primarily through the lens of food safety, market access, and environmental protection, not explicitly as climate adaptation measures. The potential adaptation co-benefits are not systematically identified, promoted, or monitored within this framework.	Explicitly recognize and promote the climate adaptation co-benefits of GAP/OA and other sustainable practices (e.g., conservation agriculture). Integrate climate resilience criteria into GAP/OA standards and certification processes where appropriate. Monitor the contribution of clean agriculture adoption to farm-level adaptive capacity and resilience. Support research on optimizing sustainable practices for both mitigation and adaptation outcomes.	MAF, MOIC (implied for standards/trade), Private Sector, Farmer Groups
Urban Development & Transport			
B.1 MPWT 5-year Development Plan 2021-2025			
1. Develop climate-resilient transport infrastructure that withstands extreme weather and disasters.	Limited specific integration of forestry-agriculture-linked risks in infrastructure design.	Conduct joint risk mapping with MAFF for erosion, flooding, and land degradation hotspots.	MPWT, MAFF, MONRE
2. Promote green and sustainable transport systems with low-carbon approaches.	Focus is more on emissions; limited cross-sector co-benefits with forestry/agriculture.	Include agroforestry corridors and carbon offset schemes with transport projects.	MPWT, DOF, MAF, MONRE
3. Integrate environmental safeguards and EIA into planning and design of road infrastructure.	EIAs often lack specific climate change projections and adaptation scenarios.	Mainstream climate-resilient EIA guidelines incorporating land-use/forest-agriculture data.	MPWT, MONRE

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
4. Disaster Risk Reduction (e.g., Early warning systems, infrastructure safeguards)	Reactive (not proactive) disaster response; gaps in community preparedness.	Scale up community-based adaptation programs; retrofit critical infrastructure.	MPWT, NDMO, UN-Habitat
5. Promote use of ICT and geospatial data for planning, monitoring and early warning.	Data integration with agriculture/forestry hazard models is minimal.	Develop shared digital platforms linking road, forest cover, and crop/climate vulnerability data.	MPWT, MONRE, MAF, NUOL
6. Enhance capacity building and training for staff on resilience and climate risk management.	Current capacity-building modules do not include forestry/agriculture adaptation content.	Develop joint curricula on nature-based solutions and climate-smart design for infrastructure.	MPWT, MAF, NUOL, DOPWT
B.2. Strategic action plan for public work and transport sector 2016-2025 and vision 2030			
1. Infrastructure Resilience (Roads, Bridges, Water Management) Objective: Enhance climate-resilient infrastructure to withstand floods, landslides, and extreme weather.	Limited integration of climate risk assessments in current infrastructure projects. Existing designs may not account for future climate scenarios (e.g., increased rainfall intensity).	Incorporate climate vulnerability mapping into infrastructure planning. Prioritize nature-based solutions (e.g., green drainage systems).	MPWT, MoNRE, MAF
2. Sustainable Transport Networks Objective: Develop low-carbon transport systems (e.g., electric vehicles, public transit) to reduce emissions and urban heat islands.	Lack of policies linking transport planning with agricultural supply chains. Minimal focus on rural access roads for climate-adaptive farming.	Integrate transport corridors with agroforestry zones. Promote EV adoption in rural areas with renewable energy partnerships.	MPWT, MoIC, MAF
3. Forestry Sector Integration Objective: Protect and restore forests to enhance carbon sequestration and watershed stability.	Weak enforcement of reforestation targets. Conflicting land-use policies enable deforestation for agriculture.	Strengthen legal frameworks for forest conservation. Incentivize agroforestry and payment for ecosystem services (PES).	MAF, MoNRE, MPWT
4. Agricultural Adaptation Objective: Promote drought-resistant crops and efficient irrigation to combat climate variability.	Limited farmer access to climate-smart technologies. Irrigation systems are outdated and energy-intensive.	Scale up drip irrigation subsidies. Establish climate information hubs for farmers.	MAF, DWR, MPWT

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
5. Cross-Sectoral Policy Coordination Objective: Align public works, transport, forestry, and agriculture policies under a unified climate adaptation strategy.	Silos between sectors hinder integrated planning. No shared metrics for climate adaptation progress.	Create inter-ministerial task forces. Develop joint monitoring frameworks with clear KPIs.	MPWT, MoNRE, MAF, PMO
6. Community-Based Adaptation Objective: Empower local communities to manage climate risks (e.g., flood-resistant farming, early warning systems).	Top-down approaches dominate; local knowledge is underutilized. Limited funding for grassroots initiatives.	Decentralize adaptation funding. Train local leaders in participatory planning and disaster preparedness.	MPWT, MAF, CSOs
B.6. Vientiane Sustainable Urban Transport_2023			
1. Transit-Oriented Development (TOD) including the BRT corridor and pedestrian zones	While the urban transport design reduces GHG emissions and supports non-motorized transport, it does not incorporate urban greening or forestry integration as climate buffers.	Integrate urban forestry into TOD zones by planting native trees along BRT lanes and pedestrian walkways to create microclimates and mitigate heat. Encourage green buffer zones between agriculture and road infrastructure.	MPWT, VCA, MONRE, DOF
2. Non-Motorized Transport (NMT) Infrastructure to reduce vehicle dependence	The plan supports reduced emissions, but lacks explicit linkages to climate-smart agriculture or peri-urban ecological corridors.	Coordinate with agriculture authorities to create green corridors that connect peri-urban farms to city markets via NMT routes, reducing transport emissions and increasing access to climate-resilient local food systems.	MPWT, MAF, VCA
3. Parking and traffic management to reduce congestion and air pollution	Focuses on emissions and traffic flow, but overlooks potential co-benefits from integrating vegetation and shade structures.	Incorporate shade-providing vegetation in parking areas and green strips alongside roads to mitigate heat and runoff, using species beneficial for urban agroforestry.	VCA, MPWT, MONRE
4. Grievance Redress Mechanism and Resettlement Plan supporting vulnerable groups	Strong in social safeguards, but does not assess climate vulnerability of affected persons, including urban poor reliant on informal agriculture.	Conduct vulnerability assessments for resettled or affected persons to understand climate risks, and offer livelihood restoration tied to climate-smart urban agriculture or greening initiatives.	MPWT, LWU, MONRE

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
5. Institutional coordination and Project Coordination Unit (PCU)	Coordination across transport and environmental sectors exists, but cross-sectoral integration with agriculture/forestry is minimal.	Expand PCU mandate to include liaison with agriculture and forestry sectors for cross-cutting climate resilience planning, especially in urban-fringe zones.	MPWT, DPWT, MAF, MONRE
6. Sidewalks and landscape improvements for walkability and aesthetics	Designs prioritize pedestrian safety, but not explicitly designed for heat resilience or ecosystem services.	Incorporate climate-resilient landscaping using local species with dual benefits (e.g., shade, erosion control, food), supporting urban greening and community farming pockets.	MPWT, DOF, MONRE
B.7. Vision to 2035 and Housing Development Strategy to 2030			
1. Promote environmentally sustainable urban development through modernized planning tools	The strategy promotes modern planning but lacks integration of climate risk assessments linked to agriculture and forestry. Urban expansion risks encroaching on ecological and agricultural zones.	Introduce land-use zoning regulations that prioritize green buffers and agroforestry belts, especially around expanding urban areas to ensure urban-rural ecological connectivity.	MPWT, DHUP, MAF, MONRE
2. Develop green and resilient infrastructure systems including housing and public spaces	Although infrastructure upgrades are prioritized, resilience to floods, droughts, and heat is not clearly defined, nor are links to ecosystem services like forest cover or water retention.	Promote nature-based solutions such as rooftop gardens, urban wetlands, and climate-resilient green spaces to enhance adaptive capacity of urban housing areas.	MPWT, DHUP, MONRE
3. Improve rural-urban linkages and ensure balanced regional development	The strategy recognizes rural-urban disparities but does not account for how climate impacts in rural forestry and agriculture may affect urban food security or migration.	Strengthen the climate resilience of rural livelihoods (agroforestry, watershed management) as part of urban growth strategies to prevent forced displacement due to climate stressors.	MAF, MONRE, DHUP
4. Establish institutional coordination mechanisms and decentralized planning capacities	Coordination mainly exists among urban planning departments, but inter-sectoral collaboration with agriculture and forestry is not systematized for climate planning.	Create inter-ministerial working groups to jointly plan and monitor climate-resilient housing and land use strategies, including forest-agriculture integration in peri-urban zones.	DHUP, MONRE, MAF, PONRE, PAFO
5. Mobilize private sector and community engagement in housing development	The strategy promotes investment but lacks incentives for climate-smart or green-	Introduce green building certifications and tax incentives for developers who	DHUP, MPI, MAF

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
	certified housing aligned with sustainable forestry/agriculture practices.	integrate climate-smart materials (e.g., bamboo, sustainable timber) and energy-efficient designs.	
6. Strengthen data systems, urban observatories, and capacity building on planning	Current data systems are insufficiently linked to agro-ecological zones or climate vulnerability assessments, making adaptation planning fragmented.	Develop integrated climate-urban-agriculture databases and conduct training for urban planners on climate modeling, agroforestry, and sustainable land use planning.	DHUP, MONRE, NUOL, MAF
Water resources			
C.1. Water Resource Strategy 2030 & Vision 2040			
Integrated Water Resource Management (IWRM) Implementation	While the strategy promotes IWRM, there is a need for stronger emphasis on climate change resilience within IWRM frameworks. Current implementation may not fully account for future climate scenarios, potentially leading to maladaptation.	Incorporate climate change projections into IWRM planning and implementation. Develop flexible management plans that can adapt to changing conditions and integrate climate-resilient practices into water resource management.	- (MONRE) - Relevant Sector Ministries - Local Authorities
Water-Related Disaster Risk Reduction	The strategy aims to reduce water-related disaster damage. However, it could benefit from a more detailed focus on the increasing frequency and intensity of extreme weather events (e.g., floods and droughts) due to climate change.	Enhance disaster preparedness and response systems, focusing on climate change-induced risks. This includes improving forecasting, early warning systems, and land-use planning to mitigate the impact of extreme events.	- MONRE - MAF) - NDMCO
Climate-Resilient Infrastructure Development	The strategy includes developing water-related infrastructure. However, there is room for improvement in ensuring that this infrastructure is designed to withstand the impacts of climate change over the long term.	Prioritize investments in climate-resilient infrastructure, such as flood defenses, drought-resistant irrigation systems, and water storage facilities. Ensure that infrastructure projects undergo rigorous climate risk assessments.	- MONRE - MPWT - MEM
Water Use Efficiency in Agriculture	The strategy addresses water use, but there could be a stronger focus on promoting water-efficient agricultural practices that are adapted to climate change.	Promote climate-smart agriculture that optimizes water use, such as drought-resistant crops, efficient irrigation technologies, and water harvesting techniques. Provide training and	- MAF - MONRE - PAFO/DAFO

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
		support to farmers to adopt these practices.	
Forestry Management for Water Regulation	The strategy recognizes the importance of forests for water resources. However, it could further emphasize the role of climate change adaptation in forest management to ensure the continued provision of water-related ecosystem services.	Integrate climate change considerations into forest management plans, focusing on forest conservation, reforestation, and sustainable forest management practices that enhance water regulation and reduce erosion.	- MAF - MONRE
Institutional Capacity Building	The strategy mentions capacity building, but there is a need for specific programs focused on climate change adaptation in the water, forestry, and agriculture sectors.	Develop and implement targeted capacity-building programs for government agencies, local communities, and other stakeholders to enhance their understanding of climate change impacts and adaptation strategies.	- MONRE - Relevant Sector Ministries - Academic and Research Institutions
C.2. 5 Years plan of DWR 2021-2025			
1. Integrated Water Resource Management (IWRM) - Objective: Enhance sustainable water management across 10 priority basins, ensuring equitable access and climate resilience.	Limited implementation of IWRM in climate-vulnerable areas, especially in managing groundwater and surface water under changing rainfall patterns. - Progress in basin planning (8/10 basins completed) but lacks adaptive measures for extreme weather (e.g., droughts in 2020).	Strengthen IWRM frameworks with climate data integration, focusing on drought/flood resilience. - Develop basin-specific adaptation plans with community participation and early warning systems.	DWR, MoNRE, PoNRE - DWR, GIZ, MRC
2. Strengthening Water Governance and Policies - Objective: Update legal frameworks to include climate adaptation, e.g., groundwater management and flood control.	Policies (e.g., Water Law 2017) exist but lack enforcement mechanisms for climate adaptation in agriculture/forestry. - Limited cross-sector coordination (e.g., agriculture/forestry) for water-use efficiency under climate stress.	Amend policies to mandate climate adaptation in water allocation, especially for agroforestry sectors. - Establish inter-ministerial task forces for integrated water-agriculture-forestry planning.	DWR, MAF, MoNRE - DWR, MAF, MoNRE, NGOs
3. Climate-Resilient Infrastructure - Objective: Upgrade water infrastructure (e.g., 38 irrigation systems) to withstand climate extremes.	Infrastructure (e.g., dams, irrigation) designed for historical climate conditions; inadequate for future variability. - Limited adoption of green infrastructure (e.g., wetlands) for flood mitigation.	Retrofit infrastructure with climate projections (e.g., higher spillway capacity) and nature-based solutions (wetlands). - Pilot green infrastructure projects in flood-prone basins (e.g., Nam Ngum).	DWR, MRC, World Bank - DWR, Provincial Governments, ADB

Content and objectives	Gaps Analysis	Preliminary recommendation	Agencies Involved
4. Data and Monitoring Systems - Objective: Improve water resource data collection and analysis for adaptive decision-making.	Water data systems (e.g., Water Resource Information System) lack real-time climate risk analytics. - Gaps in groundwater monitoring (only 4/10 basins assessed), critical for drought adaptation in agriculture.	Integrate climate models into monitoring systems for predictive water management. - Expand groundwater monitoring networks and link to farmer advisories.	DWR, MoNRE, IWMI - DWR, FAO, Local Communities
5. Community and Ecosystem-Based Adaptation - Objective: Promote community-led adaptation (e.g., 196 water monitoring stations) and protect aquatic ecosystems.	Limited community engagement in adaptation planning; ecosystem restoration (e.g., riparian buffers) underfunded. - SDG 15 (life on land) targets not fully aligned with water management (e.g., forest-water linkages).	Scale up participatory watershed management and payment for ecosystem services (PES) schemes. - Align water plans with SDG 15 by restoring forests in critical watersheds (e.g., Nam Xong).	DWR, NGOs, GEF - DWR, MAF
6. Cross-Border and International Cooperation - Objective: Strengthen regional collaboration for climate-resilient water management.	Transboundary water agreements (e.g., Mekong River Commission) lack climate adaptation protocols. - Limited funding for cross-border climate projects (e.g., flood forecasting).	Advocate for regional climate adaptation frameworks in shared basins (e.g., sediment management). - Secure climate finance (e.g., Green Climate Fund) for joint adaptation projects.	DWR, MRC, ASEAN - DWR, ADB, UNEP

7 Sectoral Adaptation Guidelines and SAP Development

The situation analysis reports can only present initial orientations and recommendations for sectoral adaptation guidelines and the development of Sectoral Adaptation Plans (SAPs) based on the preliminary analysis conducted through the climate hazard review, sectoral vulnerability assessment, legal and institutional review, and regional best practices benchmarking. However, these preliminary orientations and recommendations should be further refined and substantiated based on additional inputs from the Climate Risk and Vulnerability Assessment (CRVA), sectoral consultations, and technical validation workshops scheduled for the next phases of the project. Vulnerability scoring in particular will be held through sectoral FGDs in preparation of the CRVA. As such, these recommendations serve to structure the sectoral logic and inform upcoming discussions with stakeholders.

7.1 Review of Existing Assessments and Integration into SAP

Following an extensive document review, and in particular, for the purposes of existing assessments, the NAP-UNEP (v.6) and “Lao PDR Provincial Storyline-Based CRVA Assessment”, all of the existing proposed assessments have been ranked through the Multi-criteria analysis process (see Section 3 and Appendices 3-6).

The first 30 adaption guidelines for each Sector have been prioritized. It is suggested that the first 10 of each priority list are carried out in the three Sectoral Adaption Plans.

7.2 Preliminary Recommendations for Sectoral Adaptation Guidelines

Initial recommendations for the three sectors of (1) Agriculture & Forestry, (2) Urban Development & Transport, and (3) Water Resources, are structured around the following pillars:

- **Risk-informed planning and governance:** Introduce or reinforce adaptation mainstreaming in existing planning documents (master plans, infrastructure development plans, agricultural investment frameworks) and decision-making tools. Encourage inter-ministerial collaboration, especially following the recent restructuring of line ministries.
- Ecosystem-based and nature-based approaches.
- Green infrastructure and resilient systems.
- **Community-based adaptation and GESI integration:** Ensure targeted actions for vulnerable groups, women, and ethnic minorities. Build on national GESI frameworks and international standards from GCF and UNDP to design inclusive planning processes.
- **Finance and enabling environments:** Recommend financing strategies that align with national investment plans and climate finance opportunities. Highlight initiatives that incentivize green growth, such as Vietnam’s agriculture restructuring or Indonesia’s sustainable forest financing.

The subprojects recommended for carrying through to the Sectoral Adaption Plan for each sector are as follows;

Table 13: Adaption Measure - Water Resources

Priority	Adaption Measure - Water Resources	Cost Group
1	Build basic infrastructure and develop community water supply to cope with floods and droughts	3

3	Encourage the use of energy-efficient appliances, industrial processes, and building designs to reduce overall energy consumption and thus needing less energy from hydropower.	1
4	Improved regulation of groundwater extraction in the Mekong River Basin	2
5	Create and improve legislation and plans on groundwater management and protection, including the implementation of such legislation and plans	1
6	Implement the adaptation measures against natural disasters to ensure the quality of water resources in the face of floods and droughts, such as investing in water treatment facilities and sewage networks.	3
7	Build small, medium and large-scale community water supply systems in drought-prone and water-scarce areas in both urban and rural areas to be able to provide water during the dry season	3
8	Improved groundwater access to families not on piped system	3
10	Create and implement an investment plan for water supply infrastructure.	2

Table 14: Adaption Measure - Urban development & Transport

Priority	Adaption Measure - Urban development & Transport	Cost Group
1	Establishment and action on urban drainage Masterplans for all main cities & towns.	2
2	Improvement in enforcing the existing Decree on public burning of waste in cities	2
3	Development of basic housing and building standards to improve resilience against flooding	2
4	Create building management regulations (Building Code) and improve waste management regulations.	1
5	Improvement of action on enforcing existing Decree & regulation on public littering (litter blocks drains)	1
6	Study and develop standards and techniques for the construction, and maintenance of infrastructure related to the integration of standards for ensuring and resilient to climate change.	2
7	Assess the impact of climate change on the sector of public infrastructure and transportation, as well as build organizational and personnel capacity to develop and manage infrastructure to be resilient and able to adapt to climate change.	1
8	Develop and implement regulations, standards and plans for adaptation and investment in the field of public infrastructure and transportation.	1
9	Develop manuals on technical standards for managing the construction and repair of public works and transport infrastructure to cope with climate change.	1
10	Integrate climate change adaptation into the strategy and action plan including through results-based management framework as well as the activities and functions of programs and projects for the construction and upgrading of infrastructure proactively and concretely.	1

Table 15: Priority Adaption Measure - Agriculture & Forestry

Priority	Adaption Measure - Agriculture & Forestry	Cost Group
1	Study and adopt drought-resilient rice varieties.	1
2	Urban development plans must avoid building in areas at risks of riverine floods and landslides. Enforcement of plans need to include restriction of unplanned settlement.	1
3	Regarding land use and planning, strengthen regulations on land leases and concessions to prevent deforestation and land degradation, and increase land and forest restoration efforts.	1
4	Promote agroecological practices to improve soil management, limit the use of chemicals, enhance food safety, target niche markets, and support climate-resilient farming techniques. For example: Agroforestry, perennial pasture phases and perennial grains can all reduce soil erosion and nutrient leaching. In upland farming. Agroforestry should be promoted with contour planting of suitable tree species for production of fruits, timber, fuelwood and non-timber forest products. These can be considered examples of Ecosystem-based Adaptation (EbA).	2
5	Promote reforestation in areas exposed to high-risks of floods, storms, landslides, and others.	2
6	Apply sustainable forest and land management in the planning process to ensure local adaptation as well as national mitigation.	1
7	Policing and Provincial level control of seasonal burning	2
8	Diversifying farming systems can enhance food security during climate shocks affecting specific crops.	2
9	Integrate indigenous knowledge into adaptation planning.	1
10	Address landslide resilience in land management plans, ensuring that construction, mining, and agriculture do not destabilise slopes. To this end, EbA actions are crucial, such as maintaining a dense and biodiverse tree cover because it protects against soil erosion.	1

7.3 Suggested Content for the SAP

Each Sectoral Adaptation Plan will be developed with the following proposed structure:

- ▶ **Sector Profile and Climate Risks Overview**
 - Comprehensive Summary of climate hazards and sector-specific vulnerabilities.
 - Key sensitivity and adaptive capacity indicators.
- ▶ **Adaptation Goals and Objectives** that aligned with national development and climate policy goals.
- ▶ **Priority Adaptation Actions**
 - Short-, medium-, and long-term measures selected through the Multi-Criteria Analysis (MCA)
 - Measures should include both hard (infrastructure) and soft (capacity-building, governance) options.
- ▶ **Implementation Roadmap**
 - Roles and responsibilities of institutions.
 - Sequencing, financing needs, and synergies with existing projects.
 - Identification of Financing gaps financing instruments
- ▶ **Project sheet per identified and prioritized proposed investment**

- GEDSI and Inclusivity Strategy
- Specific entry points for mainstreaming gender and social inclusion.

The content will be finalized and validated during upcoming technical working sessions and workshops with stakeholders. Continuous stakeholder engagement will ensure the SAPs are co-owned, actionable, and aligned with Lao PDR's broader development objectives.

References / Appendices

Appendix 1_Detailed Data Collection Table

Appendix 2_FGD Guidelines

Appendix 3_Long List of Adaption Measures: Water Resources

Appendix 4_Long List of Adaption Measures: Urban Development and Transport

Appendix 5_Long List of Adaption Measures: Agriculture and Fisheries

Appendix 6_MCA Screening Spreadsheet



ABOUT THE GLOBAL GREEN GROWTH INSTITUTE

The Global Green Growth Institute was founded to support and promote a model of economic growth known as “green growth”, which targets key aspects of economic performance such as poverty reduction, job creation, social inclusion, and environmental sustainability.



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