



LAO PEOPLE'S DEMOCRATIC REPUBLIC
PEACE INDEPENDENCE DEMOCRACY UNITY PROSPERITY

LAO PDR SECTORAL ADAPTATION STRATEGY AND ACTION PLAN FOR URBAN DEVELOPMENT AND TRANSPORT SECTOR 2026-2030

UNDER THE NATIONAL ADAPTATION PLANNING PROCESS

JUNE 2026

MINISTRY OF AGRICULTURE AND ENVIRONMENT

Lao PDR Sectoral Adaptation Strategy and Action Plan (SAP) for Urban Development and Transport (2026–2030) under the National Adaptation Process.

Prepared under the guidance of:

Department of Environment (DoE), Ministry of Agriculture and Environment, Government of Lao PDR

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Acknowledgements

The Government of the Lao People's Democratic Republic recognizes the critical importance of addressing climate change and its far-reaching impacts on socio-economic development, natural resources, and the livelihoods of communities across the country. As a signatory to the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, the country has reaffirmed its commitment to enhance climate resilience and transition towards sustainable development pathways. These commitments are supported by national frameworks such as the Decree on Climate Change and the National Strategy on Climate Change by 2030, which set the ambitious target of achieving net-zero emissions by 2050.

In this context, the Ministry of Agriculture and Environment (MAE), through the Department of Environment (DOE), is leading efforts to mainstream climate change adaptation across key sectors. Building on the National Adaptation Plan (NAP) finalized in 2025, this Sectoral Adaptation Strategy and Action Plan (SAP) for the Urban Development and Transport Sector (2026–2030) provides a focused roadmap to strengthen adaptive capacity and resilience within this climate-sensitive sector.

The SAP was developed under the Green Climate Fund (GCF)-funded Readiness, titled “Support for Mainstreaming Climate Change Adaptation into Sectoral Planning in Lao PDR”, implemented by MAE with technical assistance from the Global Green Growth Institute (GGGI). It translates the NAP’s overarching priorities into actionable strategies, building upon the findings of the Sectoral Climate Risk and Vulnerability Assessment (SCRVA) and extensive consultations with sectoral focal points, development partners, and local stakeholders. This document translates the strategic direction of the NAP into actionable and measurable steps for the Urban Development and Transport Sector by setting out medium-term objectives, strategic adaptation actions, and an accompanying monitoring and evaluation framework for the period 2026–2030. It aims to guide national and subnational authorities in integrating climate adaptation measures into their respective policies, strategies, and investment plans to reduce vulnerability and safeguard livelihoods.

On behalf of the DOE, I would like to extend our appreciation to all ministries, agencies, and partners who contributed technical input and expertise throughout the development process. The DOE extends its sincere appreciation to GCF for its financial support and to GGGI for its technical assistance in facilitating the development of this SAP. The contribution of sectoral focal points, provincial departments, and all partners involved in consultations and technical discussions is gratefully acknowledged. Their expertise and engagement have been instrumental in shaping the priorities and proposed actions contained in this strategy.

The successful implementation of this SAP will require continued partnership, collaboration, and resource mobilization. We would like to emphasize the importance of sustained support in the form of finance, technology transfer, and capacity building from a broad range of domestic and international stakeholders. By strengthening cooperation and leveraging available resources, Lao PDR aims to enhance the resilience of its urban development and transport sectors, reduce vulnerability to climate impacts, and contribute to the country’s broader efforts to build a climate-resilient and sustainable future.

Yours Sincerely,



Mr. Aloune Sayavong

**Department of Environment,
Ministry of Agriculture and Environment.**

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Acronyms and Abbreviations

ADB	Asian Development Bank
AFD	Agence Française de Développement
AFoCO	Asian Forest Cooperation Organization
ASEAN	Association of Southeast Asian Nations
BRT	Bus Rapid Transit
CECCAP	Implementation of Centric Evolving Climate Change Adaptation Process
CBA	Community-Based Adaptation
CEDAW	Convention on the Elimination of all Forms of Discrimination Against Women
CRVA	Climate Risk and Vulnerability Assessment
CSO	Civil Society Organization
DAE	District Office of Agriculture and Environment
DALAM	Department of Land Administration and Management
DCC	Department of Climate Change [former department merged into DoE]
DHUP	Department of Housing and Urban Planning
DMH	Department of Meteorology and Hydrology
DOE	Department of Environment
DOT	Department of Transport
DOR	Department of Roads
DOW	Department of Waterways
DPC	Department of Planning and Cooperation
DPWT	District Office of Public Works and Transport
DRM	Disaster Risk Management
DWR	Department of Water Resources
DWS	Department of Water Supply
EbA	Ecosystem-based adaptation
EGDP	Ethnic Group Development Plan
EU	European Union
EV	Electric Vehicle
FAO	Food and Agriculture Organization of the United Nation
FDI	Foreign Direct Investment
FPIC	Free Prior Informed Consent
GAAP	Gender Action Plan
GBV	Gender Based Violence
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
GEDSI	Gender Equality Disability and Social Inclusion
GGGI	Global Green Growth Institute
GHG	Greenhouse Gas
GIS	Geographic Information Systems
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GOL	Government of Land
GWP	Global Water Partnership – Southeast Asia
HDI	Human Development Index
IDA	International Development Association
IFC	International Finance Corporation
IFAD	International Fund for Agricultural Development
IPCC	Intergovernmental Panel on Climate Change
JICA	Japan International Cooperation Agency
LAK	Lao Kip
LDC	Least Developed Country
LNFD	Lao National Development Front
LWU	Lao Women Union

LYU	Lao Youth Union
M&E	Monitoring & Evaluation
MAE	Ministry of Agriculture and Environment
MAF	Ministry of Agriculture [former ministry merged into MAE]
MCA	Multi Criteria Analysis
MEL	Monitoring, Evaluation and Learning
MEM	Ministry of Energy and Mines [former ministry merged into MIC]
MIC	Ministry of Industry and Commerce
MIS	Management Information System
MONRE	Ministry of Natural Resources and Environment [former ministry merged into MAE]
MoU	Memorandum of Understanding
MPI	Ministry of Planning and Investment
MRC	Mekong River Commission
NAP	National Adaptation Plan
NAPA	National Adaptation Programme of Action
NBS	Nature-based solutions
NBCA	National Biodiversity Conservation Area
NCCVA	National Climate Change Vulnerability Assessment
NCAWMC	National Commission for the Advancement of Women, Mothers and Children
NDC	Nationally Determined Contribution
NGO	Non-Government Organizations
NPA	National Protected Area
NPDS	National Power Development Strategy
NSEDP	National Socio-Economic Development Plan
NSCC	National Strategy on Climate Change
NUOL	National University of Laos
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
ODA	Official Development Assistance
ODAMIS	Official Development Assistance Management Information System
PAE	Provincial Office of Agriculture and Environment
PDNA	Post Disaster Needs Assessments
PIU	Project Implementation Unit
PMU	Project Management Unit
PPP	Public Private Partnership
PTRI	Public Works and Transport Research Institute
RCP	Representative Concentration Pathways
SAP	Sectoral Adaptation Plan
SAR	Situation Analysis Report
SAP	Sectoral Adaptation Strategy and Action Plan
SDG	Sustainable Development Goal
SEZ	Special Economic Zones
SSP	Shared Socio-Economic Pathways
SWG	Sector Working Group
UN	United Nations
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
UNEP	United Nation Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations Children's Fund
WASH	Water Sanitation and Hygiene
WB	World Bank
WFP	World Food Programme
WHO	World Health Organization
WMO	World Meteorological Organization
WUA	Water User Associations

Terminology and Definition

Adaptative Capacity: The ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damage, to take advantage of opportunities, or to cope with the consequences [1].

Climate Smart Agriculture (CSA): Climate-smart agriculture is an approach that helps to guide actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate. CSA aims to tackle three main objectives: sustainably increasing agricultural productivity and incomes, adapting and building resilience to climate change, and reducing and/or removing greenhouse gas emissions, where possible [1]

Climate Resilience: The capacity of social, economic, and environmental systems to cope with a hazardous event or trend, maintaining essential functions, identity, and structure while also adapting and transforming. [2].

Climate Scenario (SSP/RCP): Standardized projections used to describe possible climate futures based on greenhouse gas emission trajectories. **Representative Concentration Pathway (RCP)** represents climate modelling scenarios representing different greenhouse gas concentration trajectories adopted by the IPCC and **Shared Socioeconomic Pathway (SSP)** represents Scenarios describing possible societal futures used with RCPs to project climate impacts. [2]

Early Warning: Giving an early warning means to issue a notification and declaration of a surveillance area through media broadcasting and other means quickly, accurately and in a timely manner to allow the people, communities, organizations and all parties to have enough time to prepare in advance to respond to potential disasters [1]

Ecosystem-based Adaptation (EbA): Ecosystem-based adaptation is the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change [1]

Exposure: The nature and degree to which a system is exposed to significant historical and projection of climatic variations [1].

Flood: The overflowing of the normal confines of a stream or other body of water, or the accumulation of water over areas that are not normally submerged. Floods include river (fluvial) floods, flash floods, urban floods, pluvial floods, sewer floods, coastal floods, and glacial lake outburst floods. Climate change is projected to increase the rainfall in much of the Mekong Region as well as expected to increase rainfall intensity. Floods would therefore potentially become more frequent and more severe [1]

Greenhouse Effect: The process by which greenhouse gases in the earth's atmosphere absorb infrared radiation from the sun, reflect some of it back into space and emit some of it towards the earth. This natural process provides for relatively stable and mild temperatures on earth and in the atmosphere. However, human activity can change the concentration of greenhouse gases in the atmosphere, which can amplify the greenhouse effect [1].

Hazard: A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. [1].

Heatwave: A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage [1].

Heat Index (HI): Index that combines air temperature and relative humidity to represent the perceived temperature or how hot conditions feel to the human body. Although primarily developed for assessing human comfort and health risks, it is also relevant for agriculture and livestock management. High HI values indicate increased heat stress that can affect crop growth, reduce yields, and impair livestock performance. Days with a HI > 36°C during the growing season are considered critical thresholds, as they lead to declines in feed intake, reduced animal productivity, and heightened heat-related stress in both plants and animals [3].

Impacts: Effects on natural and human systems. In this report, the term 'impacts' is used to refer to the effects on natural and human systems of physical events, of disasters, and of climate change. [1].

Mitigation: Mitigation means the process of reducing greenhouse gas emissions and enhancing carbon sinks. [1]

Nature-based Solutions (NbS): Actions that protect, sustainably manage, and restore natural or modified ecosystems to address societal challenges effectively and adaptively. [3]

Representative Concentration Pathways (RCPs): Scenarios that include time series of emissions and concentrations of the full suite of greenhouse gases (GHGs) and aerosols and chemically active gases, as well as land use/land cover. The word representative signifies that each RCP provides only one of many possible scenarios that would lead to the specific radiative forcing characteristics. The term pathway emphasizes the fact that not only the long-term concentration levels but also the trajectory taken over time to reach that outcome are of interest. RCPs were used to develop climate projections in CMIP5.

- RCP2.6: One pathway where radiative forcing peaks at approximately 3 W m^{-2} and then declines to be limited at 2.6 W m^{-2} in 2100 (the corresponding Extended Concentration Pathway, or ECP, has constant emissions after 2100)
- RCP4.5 and RCP6.0: Two intermediate stabilization pathways in which radiative forcing is limited at approximately 4.5 W m^{-2} and 6.0 W m^{-2} in 2100 (the corresponding ECPs have constant concentrations after 2150).
- RCP8.5: One high pathway which leads to $>8.5 \text{ W m}^{-2}$ in 2100 (the corresponding ECP has constant emissions after 2100 until 2150 and constant concentrations after 2250).

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 [1].

Scenario: A plausible and often simplified description of how the future may develop based on a coherent and internally consistent set of assumptions about driving forces and key relationships. Scenarios may be derived from projections but are often based on additional information from other sources, sometimes combined with a narrative storyline [1].

Sensitivity: Sensitivity is the degree to which a system is affected, either adversely or beneficially, by climate variability or change. The effect may be direct (e.g., a change in crop yield in response to a change in the mean, range or variability of temperature) or indirect (e.g., damage caused by an increase in the frequency of coastal flooding due to sea level rise).

Vulnerability: Vulnerability refers to sensitivity and inability to cope with the impacts of climate change [1].

Executive summary

Climate Change Context in Lao PDR

Lao PDR faces mounting climate risks that increasingly threaten the country's sustainable development trajectory and the resilience of its population. Its geographic diversity and socio-economic dependence on natural resources, particularly in agriculture, forestry, and water, make it highly vulnerable to climate variability and extremes. Observed trends include rising mean temperatures (approximately +1°C since 1950), shifting rainfall patterns, and increased incidence of floods, droughts, landslides, and heatwaves. Rainfall patterns are becoming more erratic, with historical declines of over 200 mm annually and future projections indicating more intense wet-season rainfall and prolonged dry periods. These changes are already translating into longer droughts, intensified heatwaves, and shifts in seasonal cycles, posing significant risks to food and water security, ecosystems, and human health. Riverine flooding is also exacerbated by altered rainfall-runoff dynamics and upstream hydropower development, while flash floods frequently impact urban centers and upland provinces face heightened exposure to prolonged dry spells, erosion, and landslides.

The economic toll of these hazards is growing rapidly. Between 2009 and 2018, annual losses from disaster events, particularly floods and droughts, nearly quadrupled, from USD 94 million in 2009 to USD 371.5 million in 2018 equivalent to 2.1% of the national GDP and 10.2% of the national budget in that year [41].

Climate Change impact on Urban Development and Transport Sectors

Urban development and transport lie at the crossroads of Lao PDR's socio-economic transformation. Cities are engines of growth, hubs for trade and services, and critical connectors between rural production and national and regional markets. As urbanization accelerates, driven by economic expansion, industrialization, and rural-to-urban migration, urban areas are increasingly exposed to the impacts of climate change.

Extreme Heat Events



Nighttime temperatures are rising sharply across Lao PDR. Rising nighttime temperatures intensify the urban heat island effect degrading air quality, increasing energy demand, threatening infrastructure (buildings, roads, transported.) and elevating health risks for vulnerable groups. Limited green spaces and dense settlements further heighten exposure.

Droughts



Prolonged dry periods leading to reduction of surface water and groundwater availability can lead to urban water shortages that could affect sanitation, cooling, and fire safety. These shortages would disproportionately impact low-income and peri-urban households. Past events, such as the 2019 drought, have already disrupted municipal water intakes.

Floods



Short, intense rainfall events overwhelm drainage systems, with highest flash-flood risk in southern and eastern Lao PDR. Extreme events such as Tropical Storm Koguma in 2021 caused major damage to infrastructure, transport networks, and essential services. Poorly maintained drainage and rapid urban growth amplify vulnerability.

Landslides



Landslides threaten roads, bridges, and access routes, especially in mountainous provinces, disrupting mobility and emergency response. Damage increases maintenance costs and can isolate entire communities. Rapid urbanization in hazard-prone zones further heightens exposure to landslides and erosion.

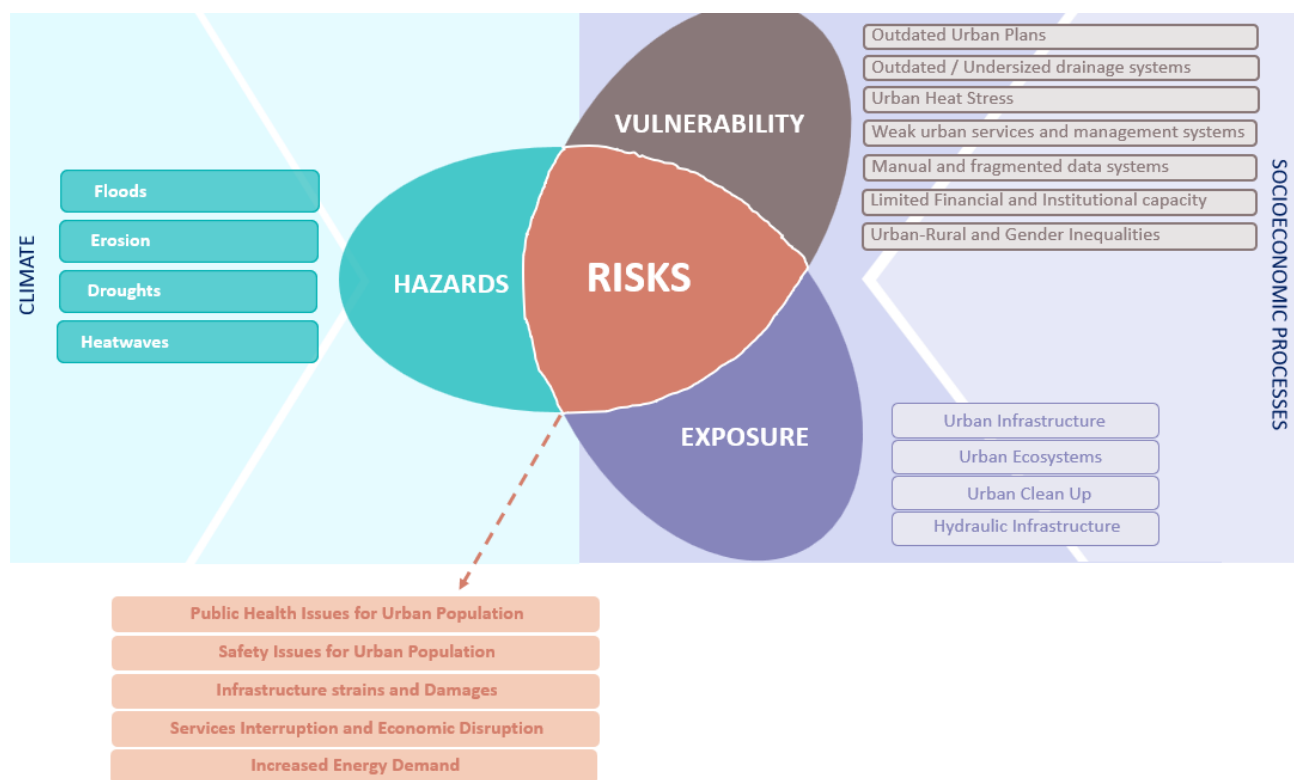


Figure 5: Climate Risk Synthesis for the Urban Development & Transport Sectors

Government of Lao PDR Adaptation response

The Government of Lao PDR recognizes climate change as a critical challenge to sustainable development and poverty reduction. The National Adaptation Plan (NAP) provides the overarching framework for identifying priority vulnerabilities, setting adaptation objectives, and integrating resilience into national, subnational, and sectoral planning. Aligned with UNFCCC guidelines, the NAP aims to reduce exposure to climate risks while strengthening adaptive capacity across communities, ecosystems, and key economic sectors. It also serves as a central mechanism for coordinating development partners, mobilizing climate finance, and embedding adaptation within the 9th National Socio-Economic Development Plan (NSED) and related national strategies.

As part of these national efforts, and in alignment with the Nationally Determined Contribution (NDC) and the National Strategy on Climate Change (NSCC 2030), the Ministry of Agriculture and Environment (MAE) has developed the Sectoral Adaptation Strategy and Action Plan for Urban Development and Transport Sectors (SAP-UrT). It aims to translate the NAP's priorities into concrete adaptation measures and provide a coherent framework to strengthen the climate resilience of cities, transport infrastructure, and services, while promoting sustainable, inclusive, and low-carbon urban growth.

Lao PDR Urban Development and Transport Adaptation Strategies and Action Plan

The SAP-UrT emphasizes the integration of Gender Equality, Disability, and Social Inclusion (GEDSI) principles, promoting equitable access to resources and opportunities.

The strategy for the Urban Development and Transport Sectors outlines three strategic outcomes, six strategic objectives, and fifteen priority actions for the period 2026–2030. These actions address technical, institutional, financial, and social barriers to adaptation and are structured around the following outcomes:

URBAN DEVELOPMENT AND TRANSPORT SECTOR ACTION PLAN: BUILDING SAFE, INCLUSIVE, AND CLIMATE-RESILIENT CITIES AND MOBILITY SYSTEMS
Outcome 1: Resilient Urban Infrastructure and Services
<i>Strategic Objective 1.1: Strengthen climate-proof urban planning and building standards</i>
<i>Strategic Objective 1.2: Improve urban drainage and flood protection systems</i>
Outcome 2: Sustainable Mobility Systems
<i>Strategic Objective 2.1: Promote low-carbon and resilient public transport systems</i>
<i>Strategic Objective 2.2: Strengthen transport resilience through planning and innovation</i>
Outcome 3: Restored and Well-Managed Urban Ecosystems
<i>Strategic Objective 3.1: Conserve and restore urban ecosystems and natural buffers</i>
<i>Strategic Objective 3.3: Strengthen sustainable waste management systems</i>

Implementation of the SAP-UrT

The Ministry of Agriculture and Environment, through the Department of Environment, will provide overall policy oversight, ensure alignment with national climate strategies, and coordinate reporting to the National Committee on Environment and the UNFCCC. Implementation of the SAP-UrT will be led by the Ministry of Public Work and Transport, and with provincial and district offices to support local delivery, monitoring, and mid-term reviews.

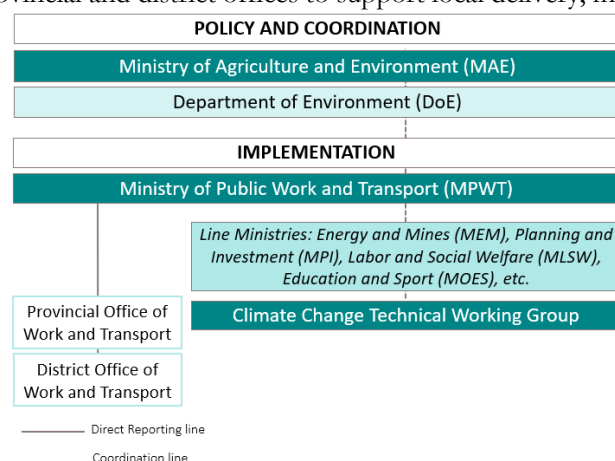


Figure 6: Institutional arrangement for the implementation of the SAP-UrT

Implementation will span five years and rely on both government systems and development partner-funded projects. To strengthen effectiveness, the SAP recommends establishing a climate resilience unit within MAE, improving data-sharing, building subnational capacity (including GEDSI integration), and involving customary governance structures in planning and monitoring.

Financing will require a dual approach. While international climate funds (GCF, Adaptation Fund, GEF, LDCF, SCCF) and ongoing donor-supported projects remain essential for scaling and leveraging synergies, the SAP-UrT must also be anchored in Government of Lao PDR budgetary processes. The action plan will therefore be aligned with the forthcoming 10th NSEDP (2026–2030) to ensure that priority adaptation measures are progressively integrated into national financing frameworks.

A dedicated monitoring framework, aligned with the NAP, NDC, and UNFCCC reporting systems, will guide progress tracking from 2025–2030. MAE/DoE and MPWT will lead monitoring in collaboration with sectoral departments and provincial offices, using harmonized, sex-disaggregated indicators. Annual reviews and a mid-term evaluation will assess achievements, identify bottlenecks, and inform adaptive management, ensuring that SAP-UrT implementation remains responsive, inclusive, and results-oriented.

PART I: CONTEXT AND GOVERNANCE

1. Introduction

Urban development and transport are central to Lao PDR's socio-economic transformation, particularly as urbanization accelerates. As of early 2025, 39.2% of the population resides in urban areas, with cities like Vientiane, Savannakhet, and Pakse expanding rapidly due to rural-to-urban migration in search of better livelihoods [4] and natural birth rate 1.6-2 person/women [42]. This growth brings opportunities for economic development but also intensifies pressure on housing, infrastructure, and essential services such as water supply, sanitation, drainage, and waste management [5].

The transport sector, historically underdeveloped compared to neighboring countries, is undergoing significant expansion. Road infrastructure remains the backbone of national connectivity, with major upgrades to highways like National Road No. 12 [6] and new projects such as the Vientiane–Nam Soi highway [7]. Rail development is also advancing, notably with the Kunming–Vientiane railway, which has already transported over 8.2 million passengers and 11.6 million tons of goods. Further integration with Thailand's rail network, through the Bangkok–Nong Khai high-speed railway, is underway, promising enhanced regional trade and mobility [8].

The country still faces complex challenges. Rapid urban growth risks unplanned settlements and inadequate access to basic services. Public transport systems remain limited, contributing to congestion and pollution. Infrastructure development often outpaces regulatory frameworks, raising concerns about sustainability and equity, and outdated drainage systems in many urban areas exacerbate flood risks during heavy rains, threatening lives and livelihoods.

Lao PDR will officially graduate from LDC status in 2026. Accordingly, urban planning in Laos has evolved into an indispensable blueprint for its “land-locked to land-linked” transformation, serving as a primary engine for growth by clustering high-value infrastructure, Special Economic Zones (SEZs), and logistics hubs within designated Tier 1 and Tier 2 cities like Vientiane, Savannakhet, and Pakse. Under the drafted 10th National Socio-Economic Development Plan (2026–2030), the Government of Laos is shifting away from haphazard sprawl toward a model of “strategic agglomeration” along the Laos–China Railway and regional corridors. This approach concentrates investments where they can most efficiently drive the targeted 7.1% growth in the service sector. This growth strategy is inextricably anchored to the NAP, which now applies a “spatial lens” to implementation. It embeds Nature-based Solutions (NbS) and flood-resilient zoning directly into urban master plans, rather than treating climate as a separate “environmental” line item. By aligning adaptation investments with the highest-value economic nodes, Laos aims to ensure that the urban development powering its future is not merely an expansion of concrete, but a climate-smart ecosystem. The strategy essentially seeks to turn the Mekong's rising waters from a seasonal threat into a managed asset through “green blue” corridors that act as a city's natural lungs and sponges.

In this context, adaptation, anticipating and addressing climate change impacts, is essential, as global warming will continue despite mitigation efforts. The GoL recognizes the challenges that climate change poses to its population, natural resources and economy, and has taken considerable measures to identify and address, to the extent possible, current and future climate risks at the policy and operational level. Aligned with its international and global commitments, the GoL has developed a wide array of national (cross-)sectoral strategies and action plans which have been translated into the national legal framework, focusing on climate change adaptation, sustainable and green growth, and disaster management since the late 1990s [3]. These include:

- climate change national strategies (2010, 2023) [9]
- health adaptation national strategy (2023) [10]
- green growth national strategy (2019),

- disaster risk reduction strategy (2020) [11]
- national sectoral policies on forestry (2005), natural resources and environment (2015), water (2023), housing and urban development (2023), and gender equality (2021).

In parallel, the government is advancing sustainable urban planning and public transport development, with ongoing efforts to improve infrastructure and enhance climate resilience. The 3rd Lao National Urban Forum in December 2024 emphasized SDG localization and youth engagement in shaping sustainable cities [12].

2. Lao PDR National Adaptation Planning Process

The policy efforts from the GoL towards climate change adaptation have translated into updating or creating transverse or sector-specific national legal frameworks on climate (2019) [13] and meteorology (2017) [14], environmental protection (2012) [15], natural resources (2017), disaster management (2017, 2019 [16], 2023), and gender equality (2019) [17].

In parallel of those legal framework, Action programmes and plans have emerged, including the National Adaptation Programmes of Actions (NAPA), approved by the government of Lao PDR in 2009, updated in 2024 under the NAP [19], and the 2013-2020 Climate Change Action Plan.

Adopted in January 2025, the National Adaptation Plan (NAP) provides Lao PDR with a long-term framework to strengthen resilience, sustainability, and inclusiveness in the face of climate change. It builds on the country's international and global commitments and also aligns with national development priorities and the 18 Sustainable Development Goals (SDGs) under the 2030 Agenda [19].



The NAP supports existing national frameworks on sustainable development and resilience such as the National Strategy on Climate Change (2030), NDC (2021), and the 9th Five-Year National Socio-Economic Development Plan (NSEDPP) [20].

The NAP outlines short-term (2025–2030) and medium-term (2030–2035) actions, aligned with national development strategies. Lao PDR NAP has two main objectives:

- “To reduce vulnerability to the impact of climate change by building adaptive capacity and resilience
- To facilitate the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programmes and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate.” [19]

Institutionally, climate action is coordinated through environmental committees at national, provincial, and district levels, and a forthcoming National Steering Committee for Climate Change, chaired by the Ministry of Agriculture and Environment (MAE) through the Department of Environment (DoE).

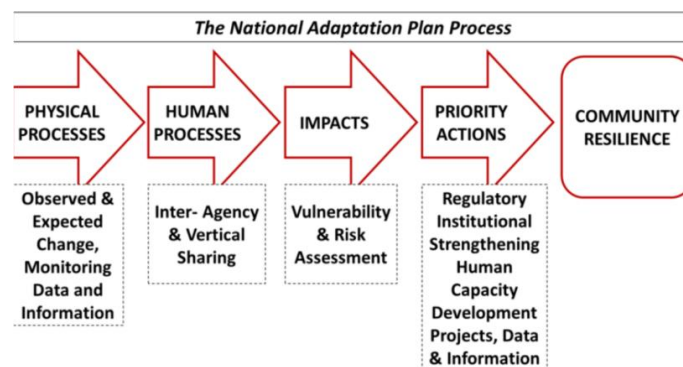


Figure 1. Overview of the Lao PDR NAP Process (source: Lao PDR NAP, p. 2)

3. The Urban Development and Transport Sector in the Framework of Lao PDR NAP

The Sectoral Adaptation Strategy and Action Plan for Urban Development and Transport (SAP-UrT) seeks to address the policy, institutional, technical, financial, and social barriers that constrain effective climate change adaptation and the sustainable development of cities and transport systems in Lao PDR. Its overarching goal is to enhance the resilience and sustainability of urban areas and transport networks in the face of increasing climate variability, ensuring safe, inclusive, and climate-responsive infrastructure and services that support sustainable socio-economic development.

The SAP-UrT forms part of Lao PDR's broader policy response to climate change and contributes directly to the achievement of national adaptation priorities under the National Adaptation Plan (NAP), the Nationally Determined Contribution (NDC), and the 9th National Socio-Economic Development Plan (NSED). Developed through a transparent and participatory process involving national, provincial, and local stakeholders, it reflects shared priorities and builds on previous initiatives and projects implemented by the Department of Housing and Urban Planning (DHUP) and the Department of Transport (DoT) under the Ministry of Public Works and Transport (MPWT), in collaboration with development partners and local authorities.

The SAP-UrT provides an overview of the key climate-related challenges facing Lao PDR's urban and transport sectors, including rising temperatures, flooding, drainage congestion, heat stress in dense urban areas, and infrastructure damage due to extreme weather events. It outlines priority adaptation measures to be implemented between 2025 and 2030, focusing on strengthening urban resilience, improving transport connectivity, promoting nature-based and low-carbon solutions, and integrating adaptation planning into urban governance and land-use management.

In total, the SAP-UrT presents a set of 15 prioritized adaptation measures responding to 6 strategic objectives and contributing to 3 major outcomes, all aligned with the NAP framework and Lao PDR's national climate and development commitments. Designed as a living document, the SAP-UrT will be monitored annually and reviewed periodically to ensure its continued relevance to evolving climate risks, sectoral priorities, and stakeholder needs.

3.1. Target audience

The SAP-UrT is primarily designed for policymakers, technical departments, development partners and private sectors involved in the planning, design, and management of urban development and transport systems in Lao PDR.

It serves as a guiding framework for integrating climate-change adaptation into urban planning, housing, mobility, and infrastructure investment decisions.

However, the strategy emphasizes the importance of cross-sectoral coordination to ensure that adaptation measures are coherent, mutually reinforcing, and avoid duplication. Climate-change impacts on cities and transport networks are closely linked to those in water resources, energy, land use, and public health, as well as to governance and social systems. Urban areas depend on reliable water supply, energy services, and efficient land-use management, while transport infrastructure plays a central role in connecting production zones, markets, and services. Strengthened coordination among these sectors will therefore enhance synergies, reduce conflicting policies, and promote efficient use of financial and natural resources.

Cross-sectoral collaboration will also enable more effective capacity building and resource optimization, by capitalizing on shared data, lessons learned, and technical expertise across institutions. Such collaboration fosters integrated and evidence-based planning, supports gender-responsive and inclusive approaches, and encourages active participation from provincial and district authorities, civil-society organizations, academia, and the private sector.

While the SAP-UrT primarily targets national policymakers, it also provides a reference for local governments and urban planners, who play a key role in translating national adaptation goals into practical measures at the city and district levels. It calls for continuous engagement and coordination across ministries, local authorities, and communities to ensure that urban and transport systems evolve toward a climate-resilient, inclusive, and sustainable development pathway.

Stakeholder Engagement Approach

The SAP implementation will rely on coordinated engagement of the following stakeholder groups presented in [Figure 2](#).

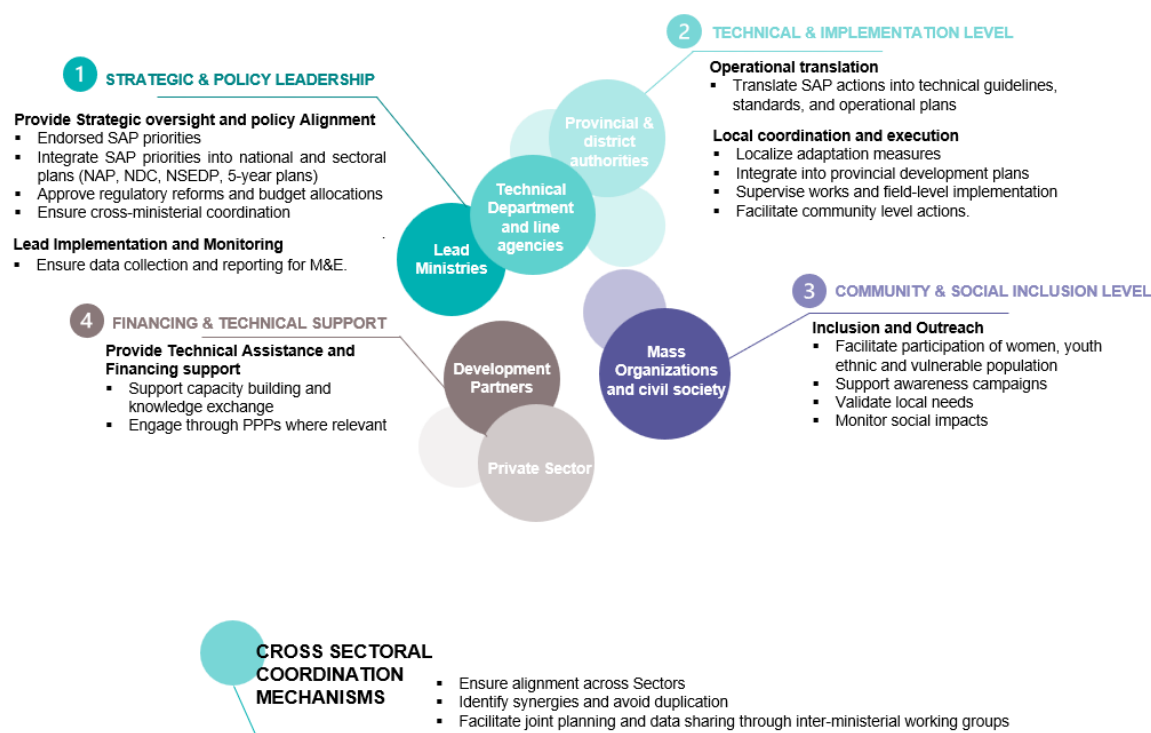


Figure 2: Stakeholder Engagement Approach for SAP implementation

This stakeholder engagement approach is structured across four complementary levels to ensure coherent and inclusive implementation of the SAPs.

1. At the **Strategic and Policy Leadership level**, Lead Ministries provide overall oversight, integrate SAP priorities into national and sectoral frameworks (NAP, NDC, NSEDP, 5-year plans), ensure cross-ministerial coordination, and oversee monitoring and reporting.
2. At the **Technical and Implementation level**, technical departments from lead agencies and provincial and district authorities translate SAP actions into operational guidelines, standards, and investment plans, while coordinating and supervising field implementation.
3. The **Community and Social Inclusion** level ensures that adaptation measures reflect local needs through the active engagement of mass organizations and civil society, promoting participation of women, youth, ethnic groups, and other vulnerable populations.
4. Finally, the **Financing and Technical Support level** mobilizes development partners and private sector actors to provide funding, capacity building, and knowledge exchange.

Together, these levels create a coordinated system that links policy direction, technical execution, social inclusion, and sustainable financing

Cross Sectoral Coordination

The parallel preparation of the SAPs for the Agriculture and Forestry, Water Resources, and Urban Development and Transport sectors has already provided a valuable opportunity for integrated planning and shared learning. Several measures have been identified as common priorities, particularly those related to sustainable watershed management, resilient livelihoods, and ecosystem protection. This coordinated approach will continue to guide the preparation of future SAPs under the first National Adaptation Plan (NAP) cycle (2025–2035), fostering a unified pathway toward a climate-resilient and sustainable development model for Lao PDR.

3.2. Principles of elaboration

The SAP-UrT is grounded in a strong national policy and regulatory framework, including the 2023 National Housing and Urban Development Strategy, the Strategic Action Plan for the Public Works and Transport Sector (2016–2025) and Vision 2030, the 2017 Law on Urban Planning (amended), the 2016 Law on Roads (amended), the 2023 Law on Waterways, and the 2019 Law on Land. These frameworks collectively promote sustainable land use, balanced urban–rural development, improved environmental quality, and climate-responsive planning. The 2019 Decree on Climate Change further reinforces the institutional basis for adaptation and mainstreaming of climate resilience across sectors.

The present SAP-UrT is designed to complement the National Adaptation Plan (NAP) by providing a roadmap for climate change adaptation in the Urban Development and Transport sectors. Thus, the SAP-UrT can be considered a sector-focused extension of the NAP, based on six main principles:

- **Investment priorities.** Identified investments must directly support overcoming barriers and scaling up climate-resilient urban development and transport;
- **Stakeholder participation.** All identified adaptation priorities must stem from transparent consultations with stakeholders from the public sector, private sector, and civil society;
- **Feasibility and operational viability.** Identified adaptation priorities must be designed to be realistic and operational for implementation;
- **GEDSI principles.** All identified adaptation priorities must benefit vulnerable groups and contribute to equitable and fair development;

- **Leadership and responsibility.** Implementation and monitoring will be carried out by identified and committed national institutions.
- **Policy alignment.** The SAP-UrT, through its identified actions, must align with and/or complement existing climate change-related national policy and (ongoing or planned) initiatives on to minimize duplication and increase efficiency;
- **Funding approach: the SAP-UrT encourages and** catalyzes private-sector investments and promotes non-state participation in adaptation.

Designed as a five-year framework (2026–2030), the SAP-UrT applies the same guiding principles and planning logic as the national NAP. It follows a structured cycle, from assessing climate risks and vulnerabilities to identifying, prioritizing, and implementing adaptation actions, and establishing a robust system for monitoring, evaluation, and learning. As a living document, it will be reviewed periodically and updated as needed to ensure continued alignment with evolving climate risks, technological advancements, and national development priorities.

4. Methodological Approach and SAP Formulation Process

The formulation of the SAP for the Urban Development and Transport sector followed a structured, participatory, and evidence-based process aligned with the guiding principles of the NAP. The approach ensured scientific rigor, inclusiveness, and alignment with national priorities and international climate commitments. The process was carried out in four main phases:

Phase 1 – Situation Analysis and Climate Risk and Vulnerability Assessment

The initial phase of the project focused on establishing the baseline necessary to guide the development of the SAP. Several preparatory activities were conducted, including gap and needs assessments. The two first activities under the ‘Output 3.2.1. Agriculture & Forestry, Urban Development, and Water Sectoral Adaptation Action Plans Develop and Disseminated’ of the GCF Readiness Project were:

- *Activity 3.2.1.1: Review and analysis of available climate information to identify the gaps and needs*
- *Activity 3.2.1.2: Conduct Climate Change Vulnerability and Risk Assessment*

The Situation Analysis Report (SAR) produced included a comprehensive review of regulations, policies, and institutional frameworks related to climate adaptation in the agriculture and forestry sectors, as well as an assessment of the socio-economic contexts. Data were collected to inform the subsequent CRVA, which analyzed climate hazards, exposure, sensitivity, and adaptive capacity at the sectoral level to identify key climate risks and vulnerabilities. SAR and CRVA provided the analytical foundation for the subsequent formulation of the SAP.

Phase 2 – Stakeholder Validation of CRVA and Identification of Initial Measures

The CRVA process was supported by extensive stakeholder engagement, including focus group discussions, presentations, and validation workshops. During these sessions, stakeholders reviewed and validated the CRVA findings and were introduced to a preliminary list of adaptation measures drawn from the NAP that aligned with the identified vulnerabilities. This participatory process generated valuable feedback, ensuring that the proposed measures reflected both local priorities and technical feasibility. A national validation workshop held in July 2025 further confirmed the relevance of the proposed measures, identified priority actions for implementation, and secured institutional ownership.

Phase 3 – Prioritization through Multi-Criteria Analysis

Why use a Multi-Criteria Analysis (MCA)?

The prioritization of adaptation measures was conducted using a Multi-Criteria Analysis approach, a widely applied decision-support tool in climate adaptation planning. MCA is particularly suitable in contexts where decisions must balance multiple environmental, social, institutional, and economic objectives under uncertainty. The approach has been extensively used in National Adaptation Plan processes and sectoral adaptation planning to support transparent, evidence-based, and participatory prioritization of adaptation options [43] [44].

An initial long list of adaptation measures was extracted from the NAP-UNEP adaptation catalogue and subsequently classified and prioritized using a Multi-Criteria Analysis (MCA). Building on the findings of the CRVA and stakeholder feedback, each proposed measure was evaluated against a set of nine criteria:

- Severity of climate change impacts,
- Poverty reduction potential,
- High value,
- Alignment with environmental and climate agreements,
- Contribution to livelihood security,
- Feasibility of implementation,
- Sustainability and long-term benefits,
- Institutional capacity,
- Financial operationalization,

- Urgency of action.

Each criterion was assigned a weight (ranging from 0.4 to 1) to reflect its relative importance, with higher weights given to feasibility, sustainability, institutional capacity, and financial viability, as these are critical for ensuring realistic and lasting implementation. Adaptation measures were then scored on a 1–10 scale for each criterion, and weighted scores were aggregated to produce a total composite score, which determined the sectoral priority ranking.

Evaluation criteria	Severity of CC Impacts			Poverty Reduction			High Value			Alignment with Env. & Climate agreements			Lives & Livelihood security			Feasibility of Implementation & availability of resources			Sustainability & long-term benefits			Institutional capacity to implement			Financial operationalization			Urgency of Action			TOTAL WEIGHTED SCORE
	Score (1 to 10)	Weighting	Weighted score	Score (1 to 10)	Weighting	Weighted score	Score (1 to 10)	Weighting	Weighted score	Score (1 to 10)	Weighting	Weighted score	Score (1 to 10)	Weighting	Weighted score	Score (1 to 10)	Weighting	Weighted score	Score (1 to 10)	Weighting	Weighted score	Score (1 to 10)	Weighting	Weighted score	Score (1 to 10)	Weighting	Weighted score	Score (1 to 10)	Weighting	Weighted score	
Proposed adaptation measures from NAP-UNEP																															
Adaptation measure 1	x	0,4	x* 0,4	x	0,6	x* 0,6	x	0,7	x* 0,7	x	0,8	x* 0,8	x	0,8	x* 0,8	x	1	x* 1	x	1	x* 1	x	1	x* 1	x	1	x* 1	x	0,4	x* 0,4	Σweighted score
Adaptation measure 2	y	0,4	y* 0,4	y	0,6	y* 0,6	y	0,7	y* 0,7	y	0,8	y* 0,8	y	0,8	y* 0,8	y	1	y* 1	y	1	y* 1	y	1	y* 1	y	1	y* 1	y	0,4	y* 0,4	Σweighted score
Adaptation measure ...	z	0,4	z* 0,4	z	0,6	z* 0,6	z	0,7	z* 0,7	z	0,8	z* 0,8	z	0,8	z* 0,8	z	1	z* 1	z	1	z* 1	z	1	z* 1	z	1	z* 1	z	0,4	z* 0,4	Σweighted score

Figure 3: Multi-Criteria Analysis framework

The weighting of criteria in the MCA reflects a deliberate effort to balance climate urgency, development impact, and implementation realism. Weights and score were first assigned through consultant judgment informed by guidance on adaptation prioritization under the NAP [11], sectoral CRVA findings, national policy priorities and then validated and refined through stakeholder consultations conducted in October 2025.



Multi-Criteria Analysis and Consultation Process

Sector-specific consultations in October 2025 included representatives from the Department of Waterway (DOW), the Department of Water Supply (DWS), the Department of Housing and Urban Planning (DHUP) and the Department of Planning and Finance (DPF).

During these consultations, participants were invited to assess and discuss proposed adaptation measures using a scoring approach based on criteria such as feasibility, sustainability, institutional capacity, and financial viability. These discussions supported the refinement and validation of the preliminary assessment initially prepared and shared with stakeholders by the Consultant following the CRVA phase.

The weighting methodology itself was designed by the Consultant as part of the MCA framework, with the objective of prioritizing adaptation actions that are not only climatically relevant, but also institutionally feasible, financially realistic, and capable of delivering sustained resilience benefits within the Lao PDR context.

While the weighting coefficients were not subject to a dedicated validation exercise, the MCA framework and prioritization methodology were presented and shared progressively throughout the assignment, including in the Situation Analysis Report and subsequent CRVA consultations and workshops. The methodology therefore benefited from multiple opportunities for review and comment by the PMU and relevant sector government stakeholders throughout the process.

Table 1: MCA weighting approach

Weight category	Higher weights (Weight = 1.0)	Medium-High Weights (Weight = 0.8)	Medium Weights (Weight = 0.6–0.7)	Lower Weight (Weight = 0.4)
Criteria	Feasibility of implementation & availability of resources Sustainability & long-term benefits Institutional capacity to implement Financial operationalization	Alignment with environmental & climate agreements Lives & livelihood security	Poverty reduction High value (economic or ecosystem value)	Urgency of action
Rationale	These criteria were given the highest weighting since based on findings from the SAR and stakeholders consultations that the main barrier to adaptation is not the lack of identified measures, but rather limited implementation capacity, financing, and institutional sustainability. Therefore, the aim was to avoid prioritizing actions that were not judged technically feasible, financially realistic, institutionally supported or sustainable over time. This approach reflects lessons learned from NAP implementation globally, where feasibility and institutional	Alignment with national and international frameworks (NAP, NDC, SDGs) is essential to ensure policy coherence, facilitate resource mobilization, and strengthen reporting under UNFCCC mechanisms. Similarly, protecting lives and livelihoods is central to Lao PDR's development priorities, particularly in agriculture-dependent and vulnerable communities. These were weighted slightly below implementation criteria to ensure that strategic alignment is strong but not prioritized over feasibility and sustainability considerations.	Poverty reduction and economic value are core development objectives. However, not all high-value or poverty-targeting measures are necessarily climate-resilient or implementable on scale. These criteria were weighted moderately to recognize development co-benefits, ensure adaptation contributes to inclusive growth, while avoiding bias toward purely economic returns over resilience impact.	Urgency is important, especially in areas exposed to severe hazards. However, urgency alone does not guarantee feasibility, institutional readiness, or long-term sustainability. Assigning a lower weight prevents short-term reactive measures from displacing structurally transformative adaptation investments. This ensures the MCA balances immediate needs with strategic resilience-building.
				16

	readiness are recognized as critical determinants of success [11].			
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Phase 4 – Drafting and Consultation of the Action Plan

From an initial long list of options drawn from the NAP adaptation catalogue, 15 high-priority actions were therefore identified and consolidated into a draft Sectoral Action Plan. This draft was then presented to sectoral stakeholders for discussion and refinement. Each of the 15 actions was assessed in terms of economic and institutional feasibility and sectoral prioritization by four key departments: the Department of Waterway (DOW), the Department of Water Supply (DWS), the Department of Housing and Urban Planning (DHUP) and the Department of Planning and Finance (DPF). The list of actions was also commented on by the Public Works and Transport Research Institute (PTRI). Importantly, the refinement process also incorporated inputs from cross-cutting institutions, including the Lao Women’s Union (LWU), Ministry of Labour and Social Welfare (MLSW), Lao Youth Union, and other mass organizations, to ensure gender equality, social inclusion, and community resilience considerations were fully integrated into the prioritization process.

To Strengthen strategic alignment, the MCA results were complemented by an analysis of climate-related projects from the Lao PDR ODA-MIS Portal was undertaken to compare the MCA results with existing ODA project portfolios. This helped identify gaps, avoid duplication, and guide sector prioritization. And to ensure strategic alignment, all selected measures were mapped against Lao PDR’s national policy frameworks, including the NAP, the NDCs, the 9th NSEDP, the Urban Development Strategy, the Strategic Action Plan for the Public Works and Transport Sector (2016–2025) and Vision 2030. Building on stakeholder consultations and that complementary analysis, the Action Plan was further refined to identify the five priority adaptation measures, for which detailed Concept Notes were developed.

In parallel, a Monitoring and Evaluation (M&E) framework was developed to support implementation and track progress toward sectoral adaptation objectives. Each priority action is linked to measurable indicators, baseline, target values, responsible institutions, and reporting frequency. GEDSI-responsive indicators are integrated throughout to ensure inclusive implementation tracking. The framework is structured to support both sector-level monitoring and aggregation into national climate reporting processes. This approach aims to ensure that implementation progress can be realistically assessed against available financial and institutional capacities.

Phase 5 – Finalization and Endorsement of the SAP

In parallel, a Monitoring and Evaluation (M&E) framework was developed to support implementation and track progress toward sectoral adaptation objectives. The consolidated draft SAP, combining the Action Plan, Concept Notes, and M&E framework, underwent internal and stakeholder review before being presented at a validation workshop on 14 and 15 January 2026 [see Workshop Report in Appendix 07]. The workshop gathered representatives from relevant ministries (MAE, MPWT and MLSW) and their technical departments and cross-cutting institutions to validate sectoral priorities and refine proposed actions. Through presentations, interactive exercises, and sector-based group discussions, participants reviewed draft strategies, prioritized Concept Notes, and provided detailed technical and institutional feedback. The outcomes of the workshop, together with written comments received subsequently, form the basis for final revisions and endorsement of the SAPs. This participatory validation process aims to strengthen national ownership and ensure alignment with sector mandates, existing planning frameworks, and implementation realities.

5. Gender Considerations

The UNFCCC calls for the mainstreaming of gender across all activities involved in the NAP process. In line with these guidelines, Lao PDR’s NAP process was intentionally designed to reduce gender-based vulnerabilities, promote equitable participation in decision-making, and ensure that adaptation measures implementation does not

reinforce existing power imbalances. The process emphasizes inclusiveness, with particular attention to enhancing the adaptive capacity of vulnerable groups during both policy formulation and implementation, ensuring that resilience benefits are shared across all societal levels.

As highlighted in the NAP, gender equality remains a national priority for the Government of Lao PDR. This commitment is supported by robust institutional mechanisms such as the Lao Women's Union (LWU) and the National Commission for the Advancement of Women, Mothers and Children (NCAWMC), the MLSW, and Lao Youth Union. These institutions play a critical role in ensuring that gender equality, social protection, youth engagement, and community resilience are integrated into climate adaptation planning. Their contributions include policy advocacy, community outreach, and implementation of gender-related programs aligned with national frameworks such as the Law on Gender Equality (2019), the National Strategy for Gender Equality (2016–2025), the Strategy for Mothers and Children (2016–2025), and the National Plan of Action on Preventing and Eliminating Violence against Women and Children.

These cross-cutting institutions were actively engaged throughout that NAP refinement process, providing inputs to ensure that adaptation priorities reflect the needs of women, elderly people, persons with disabilities, and other vulnerable groups. Their involvement helps ensure that adaptation measures are socially inclusive, culturally appropriate and aligned with national commitments to gender equality and social protection.

Nationally, Lao PDR ranked 117th out of 189 countries in the 2023 UNDP Human Development Index (HDI) [21], reflecting steady progress in human development and gender equality. However, significant gender disparities persist across education, employment, access to services, and representation in decision-making, particularly in rural and ethnic communities. These gaps underscore the importance of continued engagement of LWU, MLSW, the Youth Union, and other mass organizations to ensure that adaptation actions are equitable, accessible, and responsive to the diverse needs of the population.

The NAP emphasized the importance of a gender-responsive approach in order to increase the likelihood that adaptation investments will yield equitable benefits for people of all genders and social groups, including those who are particularly vulnerable. Adopting a gender-responsive approach to adaptation will also help to align climate policies and action with other commitments, including the Sustainable Development Goals (SDGs), the Beijing Declaration and Platform for Action and the Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW).

The SAP-UrT integrates GEDSI principles to ensure that adaptation actions are equitable, participatory, and responsive to the diverse needs of women, men, youth, ethnic minorities, and persons with disabilities. Recognizing that climate change and urban risks affect these groups differently, the SAP-UrT embeds GEDSI considerations throughout its planning, implementation, and monitoring stages.

Without deliberate GEDSI integration, climate hazards risk reinforcing existing inequalities in access to housing, mobility, and decision-making. Strengthening the resilience of urban infrastructure and transport systems must therefore go hand in hand with measures that promote equity, representation, and protection for all. The integration of GEDSI principles into the SAP-UrT ensures that the implementation phase will not only enhance climate resilience but also contribute to inclusive, accessible, and sustainable urban development in Lao PDR.

Key approaches in the strategy and proposed actions include:

- **Strategies and actions that promote inclusive urban mobility and reduce gendered time burdens:** Enhancing access to safe, affordable, and reliable public transport while addressing mobility barriers faced by women, caregivers, the elderly, and persons with disabilities through improved design, lighting, connectivity, and accessibility.

- **Indicators and targets for inclusive participation and governance:** Ensuring active engagement of women, ethnic minority representatives, youth, and persons with disabilities in urban planning processes and local adaptation initiatives. Strengthening women's leadership within community organizations, transport user associations, and urban committees through targeted capacity building and gender-sensitivity training.
- **Embedding GEDSI within the Monitoring and Evaluation framework:** Incorporating GEDSI-specific indicators to monitor progress on inclusive infrastructure design, equitable access to services, and participation in decision-making at both national and subnational levels.

6. Lao PDR Urban Development & Transport Sector

The Urban Development and Transport sectors are fundamental to the socio-economic trajectory of Lao PDR, serving as critical enablers for broader national development goals. However, this rapid growth, combined with existing infrastructural and regulatory deficits, significantly amplifies the country's vulnerability to climate change impacts, particularly hydrological hazards [3].

Lao PDR is undergoing rapid urbanization, driven by rural-to-urban migration for employment opportunities, with major cities like Vientiane capital, Kaysonaphomvihan municipal, Savannakhet, Pakse-Champasak and Tourism city hub like Louang Prabang, Vangvieng, Muang Xay and Thakhek serving as key growth hubs. As of the early 2020s, urban areas house approximately 37% of the population, projected to rise to 50% by 2030, fueled by economic development and infrastructure investments [28]. This sector integrates urban development encompassing housing, municipal services, and land use with transport systems, which are critical for connectivity and economic integration within the Greater Mekong Subregion. The government's 9th National Socio-Economic Development Plan (2021–2025) emphasizes sustainable urban growth to support poverty reduction and regional trade, aligning with ASEAN connectivity goals.

Urban infrastructure focuses on expanding housing, water supply, drainage, solid waste management, and sanitation to meet rising demands. Public transport systems are being enhanced, with initiatives like bus rapid transit in Vientiane. The transport subsector relies heavily on roads, over 90% of freight and passenger movement [29], supplemented by expanding rail networks, such as the Laos-China Railway (Kunming–Vientiane) and connections to Thailand's rail system. Airports and waterways also play roles, particularly for tourism and trade along the Mekong River. These developments aim to position Lao PDR as a land-linked hub, with investments exceeding USD 5 billion in transport infrastructure between 2016–2020 [30].

Rapid urbanization has led to unregulated informal settlements, straining access to basic services and exacerbating inequalities, particularly for low-income migrants. Infrastructure gaps include inadequate public transport, resulting in traffic congestion and rising air pollution in urban centers. Development often outpaces regulatory frameworks, leading to environmental degradation and uneven growth. In transport, challenges involve maintaining rural road networks prone to erosion and ensuring affordability for remote communities.

The transport and urban infrastructure sector in Lao PDR are highly exposed to climate hazards, notably floods and storms. In the 2018 floods, over 600,000 people were affected, and substantial infrastructure damage occurred with economic losses estimated at USD 300 million [31]. More recent events in 2024 again highlighted this exposure, with tens of thousands impacted. The particular role of dated urban drainage systems remains a concern, as heavy rainfall and flash floods continue to challenge urban resilience.

Vulnerabilities are amplified in low-lying areas along the Mekong, where river levels rise and erratic precipitation threaten bridges and roads. Adaptation priorities include resilient infrastructure design, such as elevated roads and green drainage, integrated into sectoral plans like the National Strategy on Disaster Risk Reduction (2021–2030).

PART II: THE HISTORICAL AND CLIMATE PROJECTION AND VULNERABILITY STORY

1. Climate Change Context

1.1. Observed climate trends for Lao PDR

Located in the heart of the Mekong Basin, Lao PDR experiences a tropical monsoon climate characterized by a distinct wet season (typically May-October) and a dry season (approximately November-April). Mean annual rainfall ranges broadly, often between about 1,300 mm to over 3,000 mm depending on region and elevation. Year-round temperatures in the lowlands are typically warm: monthly daytime highs often reach the low to mid-30 °C range.

Temperature



Over the past decades, Lao PDR has experienced a clear warming trend and growing climate variability. Mean surface air temperatures have increased by 0.2–0.3 °C per decade between 1971 and 2020 and an increase of +1 °C since 1950 [32]. Observations show more frequent and intense heatwaves, particularly in lowland and urban areas, and longer dry spells that strain rain-fed agriculture.

Climate models project that average annual temperatures in Lao PDR could increase by 1.5°C to 2.5°C by mid-century under moderate emissions scenarios and potentially exceed 3°C under high-emissions pathways (RCP8.5 / SSP5-8.5) [3]. These trends are already manifesting through more frequent and intense heatwaves, especially in lowland and urban areas, alongside longer and more severe dry spells that challenge rainfed agriculture. The observed changes already affect agricultural productivity, forest health, and water availability. The persistence of these trends underscores the need for strengthened adaptation and resilient resource management systems.

Precipitation



Historical records from 1950 to the present reveal a gradual decline in annual rainfall, from about 1,800 mm to 1,600 mm per year, a decrease of roughly 200 mm over the observed period. More importantly, rainfall in Lao PDR shows increasing variability and unpredictability. Analyses indicate fluctuations in the onset and cessation of the rainy season, as well as in rainfall intensity, reflecting a shift toward more erratic precipitation patterns [32].

Climate projections under both scenarios show similar trends. The observed decline in rainfall, combined with more intense rainfall events, indicates that climate variability rather than absolute rainfall shortage is becoming the main challenge. These shifts have direct implications for soil moisture, surface water availability, and crop productivity, heightening vulnerability in the predominantly rain-fed agricultural systems that sustain most rural livelihoods in Lao PDR.

Relative Humidity



Historical records indicate that relative humidity in Lao PDR has remained relatively stable over past decades, with minimal variation across regions and time. This stability has been consistent across both moderate and high emissions scenarios during the historical baseline period.

However, starting around 2025, projections show a gradual decline in relative humidity, with the rate and magnitude of change differing between scenarios. Under the moderate emissions pathway (SSP2-4.5), the decrease is slow and moderate, representing a manageable adaptation challenge. In contrast, the high emissions scenario (SSP5-8.5) projects a steeper decline after 2075, suggesting significantly drier atmospheric conditions by the end of the century. Lower relative humidity levels

would intensify evapotranspiration rates, heightening water stress for vegetation and crops and exacerbating the risk of drought, particularly in areas already vulnerable to seasonal water scarcity.

1.2. Climate related hazards impact on the Urban Development and Transport Sector

Over the past three decades, Lao PDR has faced an increasingly diverse range of climate-related hazards that have severely affected its urban systems, infrastructure, and mobility networks. Floods, landslides, heatwaves, and droughts have caused recurrent human and economic losses, highlighting the exposure of rapidly urbanizing areas to extreme events. This hazard overview synthesizes key historical evidence and spatial patterns of climate risks most relevant to the urban development and transport sectors.

Lao PDR's urban and transport infrastructure is highly sensitive to climate shocks and long-term environmental changes. Between 2009 and 2018, annual economic losses from disasters, particularly floods and droughts, rose nearly fourfold, reaching an estimated USD 371.5 million, or 2.1 % of GDP [33]. Much of this damage was concentrated in urban areas, where inadequate drainage, informal settlements, and weak maintenance exacerbate exposure. These escalating risks underscore the need for integrated planning, sustainable land use, and resilient infrastructure investments that align adaptation with low-carbon development goals.

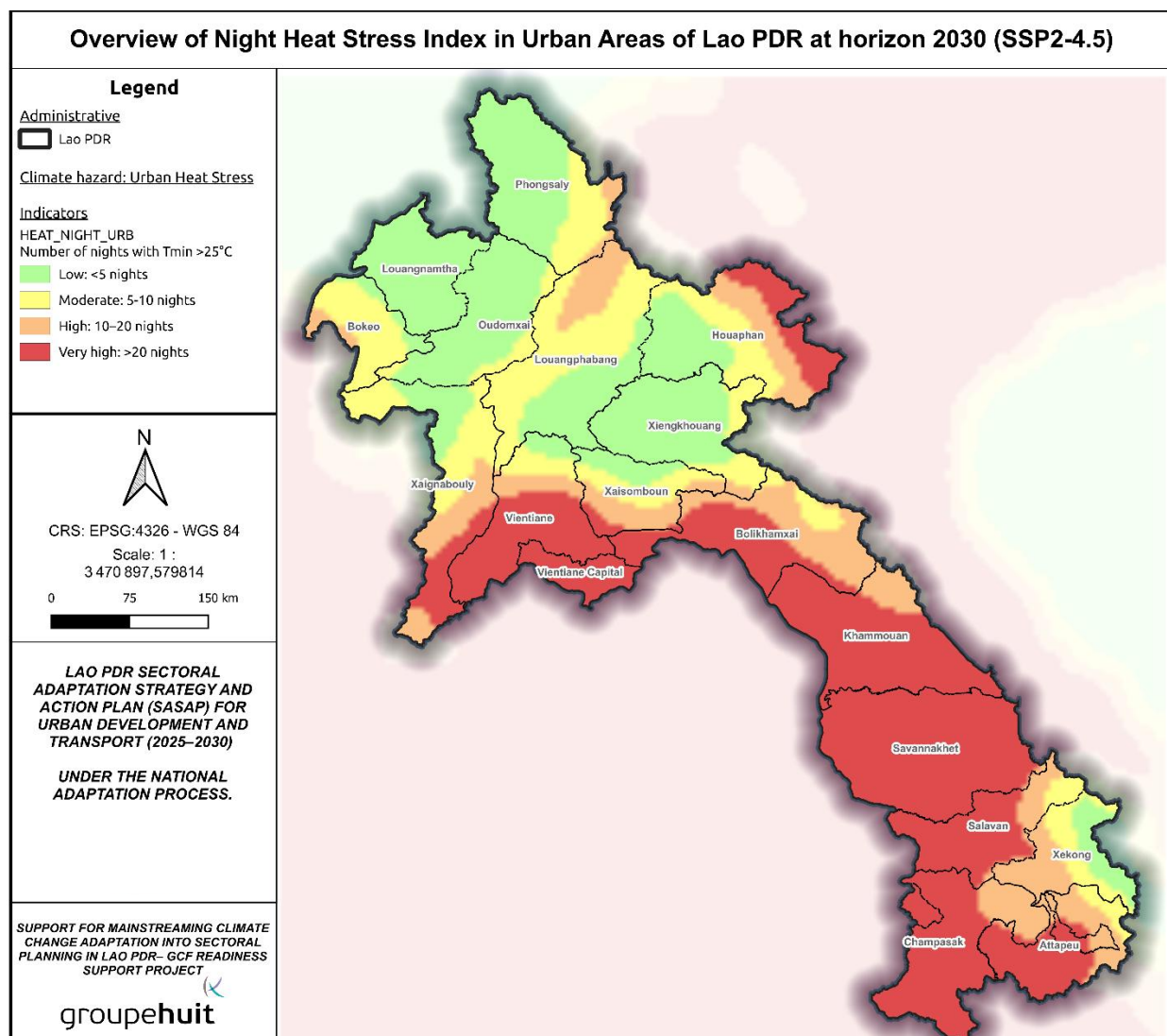
Climate change directly impacts urban water management, transport reliability, and energy supply, creating interlinked challenges across sectors. Urban floods and landslides repeatedly disrupt mobility, damage roads and bridges, and isolate communities, while heat stress accelerates infrastructure deterioration and increases maintenance costs. In cities such as Vientiane and Pakse, even moderate rainfall events can paralyze traffic and flood essential facilities due to undersized or poorly maintained drainage networks. As a result, building climate-resilient transport systems and integrating risk-based land use planning are critical priorities.

Ultimately, strengthening urban resilience will require mainstreaming climate adaptation into infrastructure design, maintenance, and urban governance. This includes areas and early warning systems, enforcing zoning regulations in high-risk areas, and promoting inclusive urban planning that protects vulnerable groups, especially low-income and informal settlers who are disproportionately affected by floods and transport disruptions.

1.2.1. Heat waves

In recent years, Lao PDR, urban residents have experience rising nighttime temperatures, echoing the heat stress experience in urban areas of Lao PDR. Historically, this risk was limited to southern and eastern Lao PDR, but projections show a sharp nationwide increase, with all regions expected to experience frequent hot nights by 2090, especially under the high-emission scenario (SSP5-8.5).

Rising nighttime temperatures intensify the urban heat island effect, reduce air quality, increase energy demand for cooling, which in turn exacerbates emissions and power stress. Prolonged heat also degrades buildings, roads, and transport infrastructure, leading to higher maintenance costs. Most critically, extreme heat poses growing health risks, particularly for vulnerable groups such as the elderly, children, and low-income residents living in dense, poorly ventilated settlements. In 2022, The World Bank estimated that 22% of urban residents lived in informal areas where exposure to heat-related illnesses is particularly acute [34]. By 2080, heat-related mortality among elderly populations could reach 72 deaths per 100,000 under a high-emissions scenario [35].



Map 1: Overview of Night heat stress Index in urban areas of Lao PDR at horizon 2030 (SSP2-4.5)

Periods of intense heat place additional strain on transport and energy systems, causing rail buckling, asphalt deformation, and surges in electricity demand. They also heighten the need for urban green spaces and shaded public areas, which remain limited in many cities. Addressing this ‘silent’ yet deadly hazard requires integrated urban planning measures, including expanded green cover, heat-resilient infrastructure materials, and equitable access to cooling and public spaces to protect vulnerable populations.

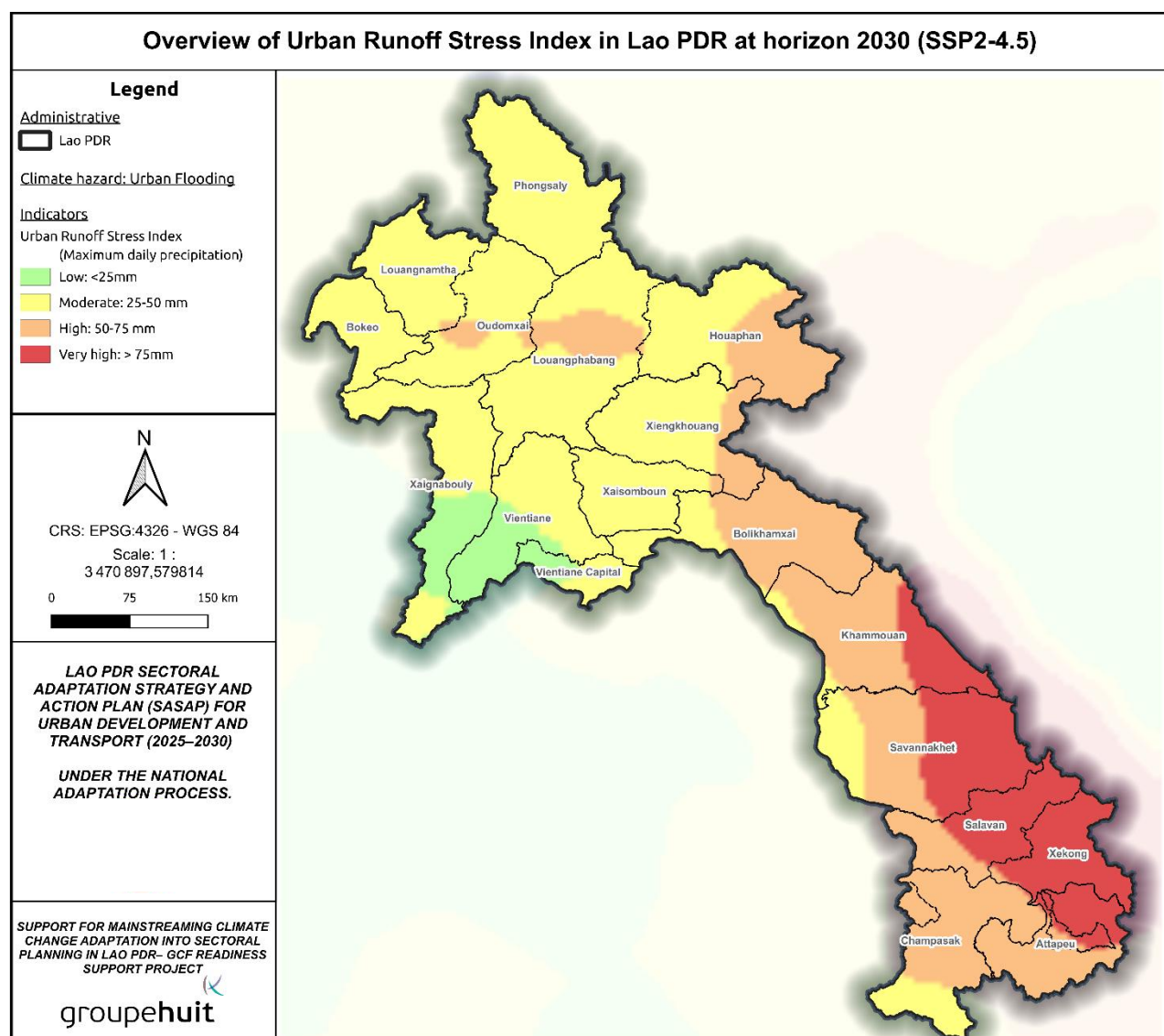
1.2.2. Drought

Similarly, prolonged drought periods can significantly affect urban systems by reducing the availability of surface and groundwater resources, leading to water shortages for domestic consumption, sanitation services, firefighting, and urban cooling. These shortages can result in hygiene issues, increased risk of disease transmission due to poor sanitation, and service delivery failures, particularly in densely populated or informal settlements. Vulnerable groups such as low-income households and residents of peri-urban areas with limited infrastructure are often the most impacted, as they have fewer alternatives and coping mechanisms. Inadequate water availability may also hinder fire suppression efforts, increasing the risk of urban fires during dry seasons. For example, during the 2019 drought in

Lao PDR, urban areas experienced critically low Mekong River water levels, affecting municipal water intake systems [36] and making river navigation and/or transportation difficult.

1.2.3. Flood

Flash flood risk in urban areas can be measured through the intensity of single-day rainfall events that capture the immediate impact of heavy downpours that frequently overwhelm drainage systems. Lao PDR display a consistent pattern of risk over time, with the highest exposure in southern Lao PDR, particularly in eastern provinces, while northern cities face moderate risk.



Map 2: Overview of Urban Runoff Stress Index in Lao PDR at horizon 2030 (SSP2-4.5)

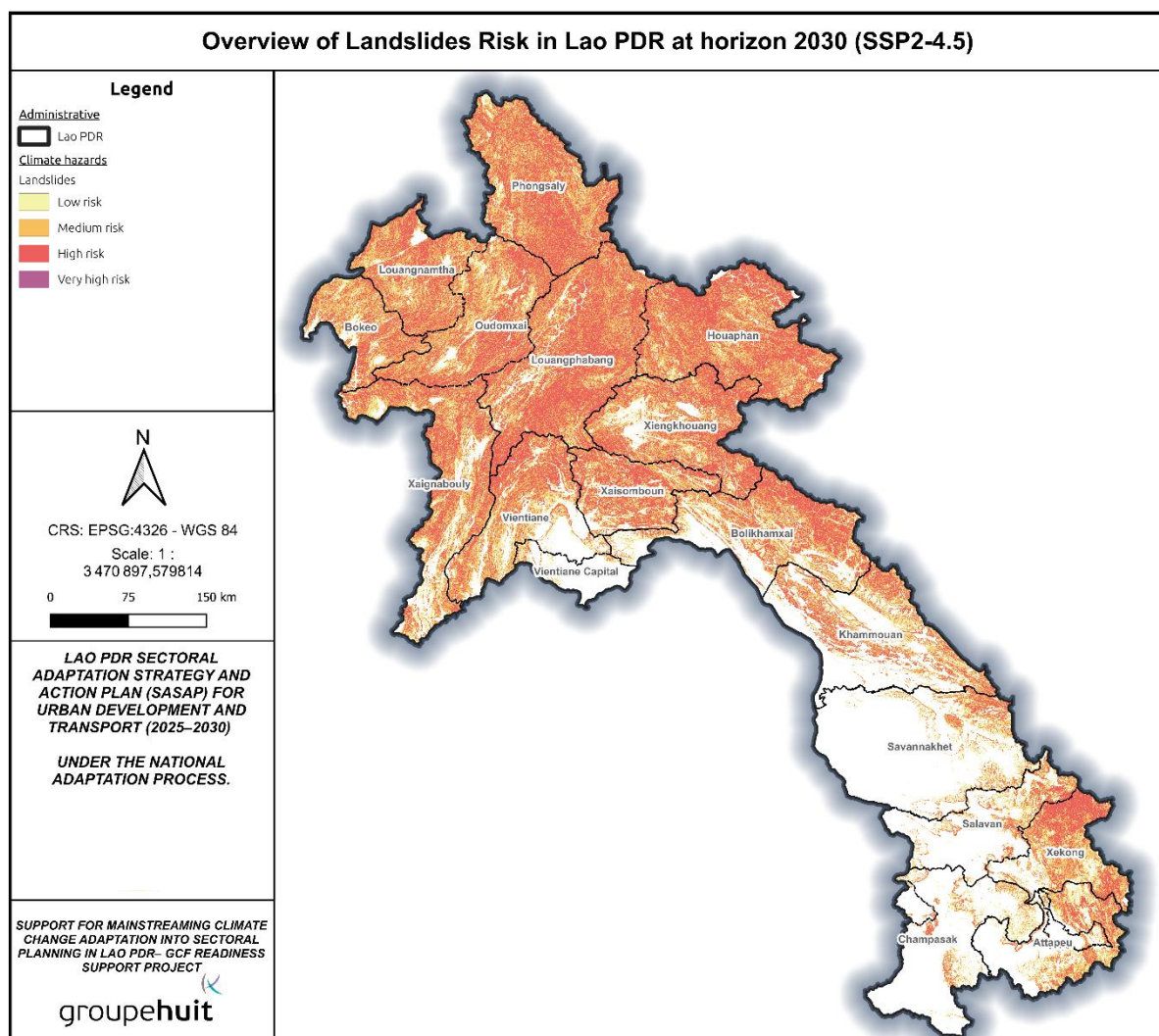
Events like Tropical Storm Koguma in 2021 illustrate the destructive potential of these short-term rainfall extremes, which caused widespread damage to infrastructure, vehicles, and agricultural land, disrupting power and water services in multiple provinces, resulting in severe infrastructure losses, valued at nearly USD 9.8 million, and extensive social and economic impacts, including the destruction of farmland, transport networks, and water supply systems [37]. Such flash floods are particularly severe in areas where rapid urbanization has outpaced drainage capacity, as in Vientiane and Pakse.

These events underscore the vulnerability of urban and transport systems to short-duration, high-intensity rainfall, particularly where drainage networks are undersized or poorly maintained. Flooding regularly disrupts essential services such as electricity, sanitation, and solid waste collection, while sewage overflow increases the risk of waterborne diseases. Low-income and informal settlements are disproportionately affected, often located in floodplains or unstable slopes with limited protection or insurance. In 2018, intense floods illustrated the scale of this risk, with over 66% of total flood damage attributed to transport infrastructure, leading to widespread road closures, loss of connectivity, and prolonged recovery times [31].

1.2.4. Landslides and erosion

Landslides pose a major threat to Lao PDR's transport infrastructure, as they can cause important damage or block the roads, bridges, and access routes, especially in mountainous and remote areas. These disruptions can isolate communities, delay emergency response, and increase transport and maintenance costs, placing additional strain on local and national budgets.

At the same time, rapid urbanization, projected to reach nearly 48% by 2025 [38], amplifies climate-related risks by concentrating populations and infrastructure in hazard-prone zones along rivers and floodplains. Uncontrolled growth intensifies pressure on drainage, waste, and transport systems, increasing exposure to floods, landslides, and heat stress.



Map 3: Overview of Landslides Risk in Lao PDR at horizon 2030 (SSP2-4.5)

1.2.5. Exposure Assessment Synthesis for Lao PDR Urban Development and Transport Sector

Urban areas in Lao PDR are increasingly exposed to climate-related hazards such as floods, heat stress, erosion, and landslides. Frequent flash floods in cities like Vientiane, Savannakhet, and Champasak stem from undersized and outdated drainage systems, with rainfall events exceeding 75 mm/day often overwhelming infrastructure, causing property damage, economic disruption, and heightened public-health risks. In parallel, the urban heat island effect raises nighttime temperatures by 3–5 °C, worsening heat-related illnesses and increasing energy demand for cooling. The road and rail networks are highly vulnerable to these conditions, with floods, slope failures, and erosion affecting connectivity and safety. In recent years, severe weather led to the temporary suspension of Lao-China Railway (LCR) services due to landslides and track flooding, illustrating the sector's exposure to extreme events. Urban expansion along the Mekong River and its tributaries further compounds risks, exposing housing, infrastructure, and transport routes to flooding and riverbank erosion.

The exposure levels presented in [Table 2](#) are derived from the Climate Risk and Vulnerability Assessment (CRVA) conducted for Agriculture and Forestry, Water Resources and Urban Development and Transport sector in Lao PDR under the *Readiness Support for Mainstreaming Climate Change Adaptation into Sectoral Planning* project.

In the CRVA Hazard exposure was assessed using climate indicators developed through the consultant's modeling environment (Klim tool), based on historical data (1950–2020) and future projections under SSP2-4.5 and SSP5-8.5 scenarios. For each hazard (heatwaves, droughts, floods, landslides), sector-specific indicators were defined and thresholds were established to classify exposure into four categories: Low, Moderate, High, and Very High (see details in [Appendix 01](#)).

The synthesis table identifies, for each sector and hazard, (i) the level of hazard exposure -severity of hazard- and (ii) the provinces showing the highest severity, based on spatial analysis of the modeled indicators.

Table 2: Exposure Assessment Synthesis

Hazards	Categories	Severity of hazard	Provinces with the highest severity of hazards
Heatwaves	Urban infrastructure	Moderate	Northern provinces Phongsaly Oudomxay
	Urban ecosystems	Moderate/High	
	Urban clean-up	High	
	Hydraulic infrastructure	Moderate/High	
Droughts	Urban infrastructure	High/Very High	Southern provinces Champasak Khammouane
	Urban ecosystems	High/Very High	
	Urban clean-up	High/Very High	
	Hydraulic infrastructure	High/Very High	
Flooding	Urban infrastructure	Moderate/High	Southern provinces Xekong Khammouane
	Urban ecosystems	Moderate/High	
	Urban clean-up	Moderate/Very High	
	Hydraulic infrastructure	Moderate/High	
Landslides	Urban infrastructure	Moderate/High	Mountainous provinces Phongsaly Oudomxay
	Urban ecosystems	Moderate/High	
	Urban clean-up	High	
	Hydraulic infrastructure	Moderate/High	

2. Vulnerability Context

In addition to exposure to climate variability, Lao PDR's urban and transport sectors face heightened vulnerability due to rapid urbanization, limited adaptive infrastructure, and socioeconomic disparities. Urban vulnerability in Lao PDR is not solely the result of climate hazards such as flooding, extreme rainfall, and rising temperatures. It emerges from the interaction between rapid urbanization, spatial planning gaps, infrastructure deficits, and socio-economic inequalities. Climate impacts therefore act as risk multipliers within already stressed urban systems. While cities are expanding as centers of growth and employment, uneven development, informal settlements, and inadequate urban services increase exposure to floods, heat, and landslides. The country ranks 142 out of 181 on the ND-GAIN Index, reflecting how intersecting geographical, institutional, and developmental challenges constrain its overall adaptive capacity [39].

The sector's high exposure to climate related hazards is intensified by institutional and socioeconomic fragilities. Many urban development's plans date from the 1990s and are misaligned with current climate realities [29], while urban management and data systems remain fragmented and largely manual, limiting evidence-based decision-making [29]. Insufficient financial and institutional capacity constrains the scaling-up of climate-resilient projects [29]. Rapid urbanization has also deepened urban-rural and gender inequalities: low-income households and informal settlements are often located in hazard-prone zones with limited access to safe housing, transport, and basic services [29]. The exposure of critical facilities, schools, hospitals, government buildings, to flood and heat hazards threatens essential service continuity.

Rapid Urbanization and Spatial Expansion

Urban growth in Lao PDR, particularly in Vientiane Capital and secondary cities, has accelerated in recent years. However, risks arise when expansion occurs in low-lying floodplains, peri-urban wetlands, and areas with limited drainage capacity especially when cities expand horizontally without proportional investment in stormwater systems, retention areas, and zoning enforcement. Informal or unplanned settlements frequently develop in hazard-prone zones due to affordability constraints, insecure land tenure, and proximity to employment. These areas often lack adequate drainage, solid waste management, and resilient road access, making them disproportionately vulnerable to extreme rainfall events.

Infrastructure Sensitivity and Interdependence

Roads, bridges, drainage systems, electricity networks, and water supply infrastructure are interconnected. Flooding of transport corridors can disrupt access to hospitals, markets, schools, and emergency services. Landslides along transport corridors in mountainous provinces can isolate entire communities. Inadequate drainage capacity, blocked canals, and insufficient maintenance amplify flood intensity. Urban transport systems, particularly low-elevation roads, are highly sensitive to extreme rainfall and waterlogging. Recurrent damage increases long-term fiscal pressure on municipalities and the national transport budget. In addition, urban heat is an emerging risk, especially in densely built areas with limited green space. Heat stress affects labor productivity, public health, and infrastructure durability

Socio-Spatial Inequality

Urban climate risk is unevenly distributed. Low-income households, informal workers, women-headed households, migrants, elderly persons, and persons with disabilities face higher exposure and lower adaptive capacity. Women often rely more heavily on public or non-motorized transport and may face mobility constraints during flooding. People with disabilities encounter accessibility barriers when transport systems and evacuation routes are not universally designed. Informal settlement residents often lack formal insurance, savings, or secure tenure, reducing recovery capacity after climate shocks. Climate impacts therefore intersect urban poverty, tenure insecurity, and access to services.

Governance and Planning Constraints

Urban resilience depends not only on infrastructure but on planning systems. Fragmented institutional mandates between national and provincial authorities, limited enforcement of zoning regulations, and constrained municipal budgets weaken adaptive capacity. Integration of climate risk into land-use planning, building codes, and transport standards remains uneven.

Projected increases in extreme rainfall intensity, heatwaves, and hydrological variability will amplify existing urban vulnerabilities. Climate change does not create vulnerability in isolation; it exacerbates structural weaknesses in land-use management, drainage systems, transport planning, and social protection. Urban resilience in Lao PDR therefore requires an integrated approach that links spatial planning, transport design, infrastructure standards, environmental management, and inclusive governance. Addressing vulnerability demands not only hazard reduction but systemic reform in how cities are planned, financed, and managed.

2.1. Who is most vulnerable and Why?

It is important to remember that vulnerability to climate change is not experienced equally across populations. Gender, disability, ethnicity, age, and socio-economic status all intersect to shape individuals' and groups' capacity to cope with and adapt to climate risks. In Lao PDR, women, persons with disabilities, ethnic minorities, and other marginalized groups often face structural barriers to accessing information, resources, and decision-making processes, which heightens their vulnerability [36]. Women's mobility is restricted by socio-cultural norms and safety concerns, while persons with disabilities and older residents face additional barriers due to inaccessible infrastructure and limited inclusive design standards [41]. Limited participation in governance, lower income levels, and reduced mobility can restrict adaptive capacity and increase exposure to hazards.

Multiple determinants of vulnerability emerge from national socio-economic trends and urban transformation dynamics. Women, persons with disabilities, ethnic minorities, migrants, and low-income urban households often face structural barriers in accessing safe housing, reliable transport, climate information, and decision-making processes, which heightens their vulnerability to urban climate risks [24].

Climate-induced hazards such as heavy rainfall, urban flooding, heatwaves, landslides along transport corridors, and infrastructure disruption disproportionately affect marginalized groups. Women, elderly persons, persons with disabilities, migrants, and low-income urban residents often depend on public or informal transport systems and have limited financial capacity to recover from infrastructure damage, housing loss, or service disruption.

In addition, limited availability of disaggregated urban data (e.g., informal settlement mapping, transport accessibility data, disability-sensitive mobility data, disaster loss data) constraint targeted and inclusive urban adaptation planning.

Women vulnerability factors



Women's labor force participation has steadily increased since the 1990s, reaching 61.5% in 2024, yet remains 9.2 percentage points lower than men's participation rate of 70.7% [48]. However, Lao PDR has a major gender gap in transport employment: only about 9% of workers in the transport sector are women [46]. Women also carry a disproportionate share of unpaid care and domestic work, spending about 1.4 times more time on such activities than men [48]. Women's high time allocation in unpaid productive and household work contributes to their non-empowerment [48].



In Lao PDR transportation and mobility patterns are closely influenced by gender roles and social expectations. Women's daily travel choices, time use, and access to transport are often shaped by their domestic and caregiving responsibilities, which limit their mobility range and flexibility compared to men. This reduced access to safe, affordable, and reliable transport options restricts women's participation in education, employment, and decision-making activities [47].



Gender gaps persist in education, as only 19.3% of women aged 25 and older have completed secondary education compared to 31% of men, and the gap widens beyond secondary level. Literacy rates are also lower among women in low-income households (66% compared to 81% for men) [48].



Women in governance and leadership remains limited across scales, undergoing a setback since 2020. In 2024, women represented 2% of village chiefs, 17% of director generals in line ministries, and 22% of national parliament seats were held by women against 27,55% in 2020 [48]. As for senior and middle management positions, women represented 25.7% in 2022 [48].



Women face structural socio-economic constraints that reduce their adaptive capacity in urban contexts. Concentration on informal or low-wage employment increases income instability during climate shocks such as flooding or transport disruption. Lower asset ownership and limited access to formal credit constrain investments in resilient housing and mobility. Women-headed households in under-serviced neighborhoods may therefore face disproportionate exposure to urban climate risks.

Persons with Disabilities (PWDs) and Elderly vulnerability factors

On one hand Lao PDR's population is gradually ageing. While Lao PDR is still considered a relatively young country with around 60% of its population under 30 years old, the share of older persons aged over 60 years old is steadily increasing [49]. The country is entering a demographic transition phase where the proportion of elderly is growing faster than institutional systems are adapting. Since Lao PDR does not yet have universal pension coverage -very few workers such as civil servant benefitting from structured pension schemes- many elderly depend on family support or continue to work at advanced aged [50].

On the other hand, persons with disabilities (PWDs) represent a significant but often under-documented segment of the population. According to the Lao Population and Housing Census and WHO estimates, disability prevalence may range between 2–5% depending on measurement definitions, though underreporting remains likely [51]. PWDs face multiple barriers that increase climate vulnerability such as limited mobility during extreme events and reduced access to evacuation infrastructure.



Urban infrastructure, including sidewalks, bridges, public transport vehicles, drainage crossings, and evacuation shelters, is often not designed according to accessibility standards. During floods, heatwaves, or landslides, evacuation and access to emergency services can be particularly challenging for individuals with reduced mobility.



Elderly persons are physiologically more vulnerable to heat stress, dehydration, and air pollution. Urban heat island effects in dense built-up areas increase health risks. Disruptions to transport systems or road access can limit access to healthcare facilities and social protection services.



Socio-economic constraints further reduce adaptive capacity. Limited pension coverage and dependence on informal employment increase vulnerability to economic shocks caused by infrastructure disruption. Lack of accessible transport and inclusive urban planning risks reinforcing exclusion during climate events.

Urban Informality and structural vulnerability

Lao PDR's urban economy is characterized by high levels of informality, with approximately 83% of total employment classified as informal [52]. In urban and transport-related sectors, including construction, wholesale trade, logistics, street vending, and motorcycle taxi services, many workers operate as own-account workers or in small, unregistered enterprises with limited access to social security and income protection. Only around 7–11% of non-civil servant workers are covered by formal social security schemes [52]. Because informal workers rely on daily earnings and often lack secure tenure, climate shocks create compounded vulnerability.

This high degree of informality increases climate vulnerability in multiple ways. Informal workers often lack stable income, savings, insurance, and legal protection, reducing their capacity to absorb shocks from floods, extreme heat, or disruption of infrastructure. Transport disruptions during extreme weather events directly affect drivers, delivery workers, and small traders whose earnings depend on daily mobility. Heat exposure disproportionately affects construction workers, street vendors, and transport operators working outdoors. Without formal employment contracts or social protection, these workers have limited access to compensation, paid leave, or recovery mechanisms following climate-related income loss.

In addition, rapid urban expansion in Lao PDR is accompanied by growth in informal and low-income housing areas, particularly in peri-urban zones where land use planning has been weak and development has encroached on natural wetlands and hazard-prone areas [53]. Many residents of these areas are rural–urban migrants engaged in informal employment, often in construction, transport, domestic work, or small trade. Informal housing areas frequently lack adequate drainage, waste management, road access, and flood protection infrastructure, increasing exposure to flooding and water-related hazards.



Insecure land tenure discourages long-term investment in resilient housing and infrastructure improvements. Households may be reluctant to upgrade structures or install protective measures due to fear of eviction or unclear property rights. As a result, housing structures in informal settlements may lack durable materials, proper drainage connections, or secure foundations, increasing exposure to heavy rainfall, urban flooding, and storm events. Limited solid waste management can exacerbate drainage blockage, intensifying flood impacts.



Infrastructure deficits, including limited road connectivity, poor lighting, lack of paved surfaces, and inadequate stormwater systems, reduce evacuation capacity and emergency access. Flooded roads can isolate communities, limiting access to schools, healthcare facilities, and markets. As climate change intensifies rainfall variability and extreme weather events, informal settlement dwellers face compounding risks linked to infrastructure gaps, tenure insecurity, and limited adaptive capacity.

Rural–urban migrants are frequently overrepresented in informal employment. Migration driven by economic opportunities along development corridors or in expanding cities may result in precarious employment conditions, limited documentation, and reduced access to municipal services, further increasing vulnerability to urban climate shocks. Rural–urban migrants are also often concentrated in peri-urban or informal areas due to affordability constraints. The intersection between informal employment and precarious urban living conditions therefore creates a multidimensional vulnerability pattern within Lao PDR’s urban development and transport context: housing damage, loss of income, and limited access to formal recovery support occur simultaneously.

2.3. When Vulnerability meets climate hazards

Regarding Climate Change, climate-induced hazards such as urban flooding, heatwaves, droughts, and erosion disproportionately affect vulnerable groups, including women, persons with disabilities, the elderly, low-income households, and informal settlers. In the urban development and transport sector, these impacts can exacerbate existing inequalities by limiting access to essential services, mobility, safety, and economic opportunities.



Urban flooding and heavy rainfall frequently disrupt transportation systems, hinder access to schools, healthcare, and workplaces, and may confine people with reduced mobility or caregiving responsibilities, most often women and persons with disabilities, to their homes. Informal settlements, often located in flood-prone or poorly drained areas, tend to be more exposed to flooding and receive less investment in resilient infrastructure, amplifying risks for low-income and socially excluded communities. Women are also disproportionately affected by floods due to the risk of experiencing GBV in temporary shelters and camps [22].



Heatwaves exacerbate health risks, especially for pregnant women, the elderly, children, and outdoor workers, many of whom are engaged in the informal sector and may not have access to cooling or green spaces. Households without air conditioning or access to urban green areas experience greater physical and psychological stress. This highlights the intersection between urban planning and social inequality, as lower-income households tend to live in denser, less vegetated neighborhoods. Additionally, infants, elderly people, people with disabilities, and those with chronic illnesses are highly vulnerable to heat-related health risks due to reduced thermoregulation. Infants and people over 75 are particularly at risk, and in Lao PDR, the population aged 65 and above is projected to triple by 2050 [23].



Erosion and landslides, especially in hillside urban settlements or along transport corridors, can isolate communities and restrict access to essential services, disproportionately affecting women, children, the elderly, and persons with disabilities. Women’s caregiving roles and limited mobility often increase their risk during evacuation or when transport routes are disrupted [24] [25].

Multiple determinants of vulnerability are also evident in the urban development and transport sectors. Women, persons with disabilities, ethnic minorities, and other marginalized groups often face structural barriers to accessing information, resources, services, and decision-making processes, which heightens their vulnerability. In urban areas, these groups are more likely to live in informal or hazard-prone settlements with limited access to safe housing, drainage, and reliable transport. Women, in particular, face constraints linked to mobility, caregiving responsibilities, and safety concerns that restrict their access to employment, education, and public participation [25]. Persons with disabilities and the elderly also face obstacles due to inaccessible infrastructure and limited inclusive design standards [26]. Limited participation in urban governance, lower income levels, and reduced mobility collectively weaken adaptive capacity and increase exposure to climate-related hazards such as floods, heat, and landslides [27].

3. Climate Risk Synthesis

Climate risk centers on the interaction between hazard, vulnerability and exposure as per the IPCC risk framework. Risk is typically estimated as the product of the probability of hazard occurring and the impact it would have on the system if it did occur.



Figure 4: Interrelations between components of climate risk [45]

A Climate Risks Synthesis for Urban Development and Transport is presented in Figure 5.

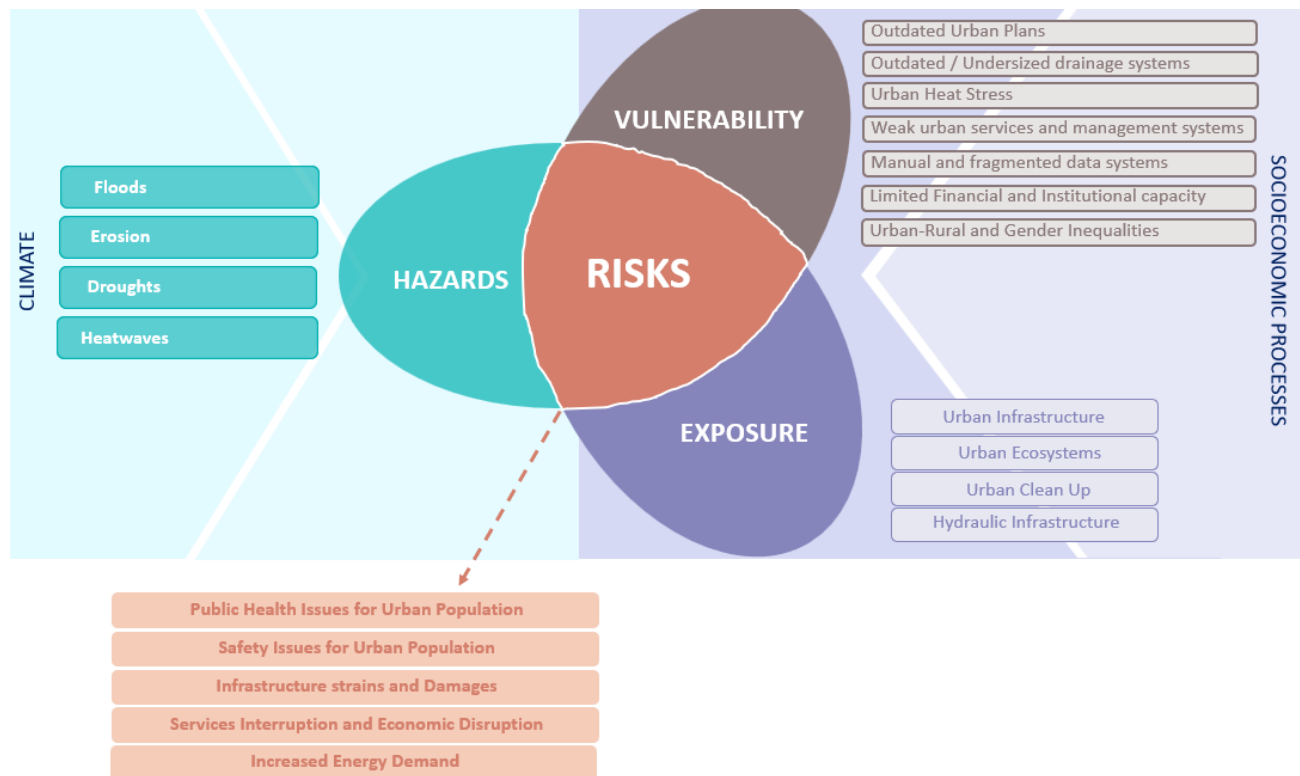


Figure 5: Climate Risk Synthesis for the Urban Development and Transport sector

PART III: POLICY AND INSTITUTIONAL FRAMEWORK

4. Current institutional arrangements

Ministry of Public Work and Transport scope is comprehensive, encompassing both Transport and Public Works sectors. The Ministry is responsible for terrestrial transport (Roads, Railways), air transport (Civil Aviation), maritime transport (Waterways), and foundational public services (Housing, Urban Planning, and Water Supply).

Recognizing this acute vulnerability, MPWT has formally "adopted a policy on mainstreaming climate resilience into this sector". This high-level commitment is translated into internal strategic guidance, notably through the Draft Urban Development Strategy to 2030, which explicitly calls for "enhanced resilience in urban development," providing a mandate for its urban planning departments.

The operational resilience strategy of MPWT is distributed across several key departments and affiliated agencies. These departments execute the policy, manage assets, and conduct the necessary research and planning:

- Department of Housing and Urban Planning (DHUP): Responsible for urban resilience planning and housing.
- Department of Roads (DoR): Manages national and local road infrastructure design and maintenance.
- Department of Transport (DOT): Oversees the comprehensive multi-modal transport system.
- Department of Planning and Finance (DPF): Integrates budget, investment screening, and ensures fiscal alignment with sectoral plans. DPF is climate change coordinator among the
- Public Works and Transport Research Institute (PTRI): Provides technical research, standardization, and coordination on environmental and social safeguards.
- Other key entities include the Department of Waterways, Department of Water Supply, Department of Civil Aviation, and the Department of Railways.
- The provincial of Public Work and Transport (PPWT) comprised implementation arrangements same as ministry level, but implementing at the province level remain the major sections like roads, transport, housing and urban planning, waterway, water supply these sections are key technical guideline support the implementation on ground with district and communities.
- District Public Work and Transport play crucial roles for operational at the district level; they operate the climate change adaptation according to provincial and national policy and instruction.
- All levels have established mass organization like Lao Women Union, Youth union in their organization to ensure that align with national Lao Women Union and Lao Youth Union.

5. Climate change policy framework and legislation

The Government of Lao PDR has established a comprehensive policy framework to align national development with climate change response and a low-carbon pathway.

The cornerstone of this framework is the 2019 Decree on Climate Change, which provides the legal basis for pursuing climate-resilient, low-emission growth. This decree designates the Ministry of Agriculture and Environment (previously Natural Resources and Environment (MONRE)) as the lead agency for coordinating the national climate response across all line ministries.

This legislative mandate is operationalized through key strategic documents:

- The National Strategy on Climate Change (NSCC, 2023): Sets the overarching goal of enhancing resilience, adaptation, and risk reduction, aiming for Net Zero Emissions by 2050.
- The Nationally Determined Contribution (NDC) the NDC3.0 is being developed: Elevates adaptation as a national priority, specifying sectoral actions relevant to MPWT, such as urban flood mitigation through riverbank protection and drainage improvements.

Table 3: International and National Framework for Climate Adaptation in Lao PDR

Framework	Key focus /contribution
Paris Agreement on Climate Change (2015)	Set global goal on adaptation to enhance adaptive capacity, strengthen resilience, and reduce vulnerability to climate change.
The first Biennial Update Report of the Lao PDR - 2020	Focuses primarily on greenhouse gas inventory and mitigation actions.
Green Growth Strategy (2019)	Promotes low-carbon development, resource efficiency, and inclusive growth.
9th National Socio-Economic Development Plan (NSEDP) 2021-2025	Integrates climate indicators into national planning and monitoring frameworks.
National Strategy on Climate Change toward 2030 (NSCC 2030)	Sets strategic direction across 8 sectors; built on resilience, mitigation, and green growth pillars.
National Adaptation Plan (2025)	Framework for sectoral adaptation strategies; aligns with Paris Agreement commitments.
Nationally Determined Contributions (NDCs) 2020-2025	Emissions reduction and adaptation targets under the UNFCCC
Sectoral Adaptation Strategies and Action Plans (SAPs) 2021-2030	Operationalize NAP across agriculture, forestry, water, health, and infrastructure.

Table 4: Legislation Framework for Climate Adaptation in Lao PDR

Legislation frameworks	Key focus /contribution
Environmental Protection Law (Revised, 2024)	Mandates EIAs, pollution control, and climate-sensitive project screening.
Decree on Climate Change No. 09/PM, 2019	Mandates climate integration across ministries; establishes Department of Climate Change (DCC) [now Department of Environment - DoE]
Law on Disaster Risk management (2019)	Establishment of Disaster Management Committees, Disaster Risk Reduction (DRR) Measures, and Emergency Response and Relief protocols

The current implementation roadmap is the NAP process, which is critical for translating policy into actionable projects. A key output is the National Climate Change Vulnerability Assessment (NCCVA), designed to provide the site-specific data essential for MPWT's physical planning and investment strategies.

Climate change sectoral adaptation plan is corner stone to mainstream the climate change adaptation to specific sectors, and this is another critical document as urban development and transport sector adaptation plan as part of the operationalization the climate change adaptation mainstream.

A critical challenge remains: the effectiveness of "climate-resilient" infrastructure depends entirely on the accuracy of future hazard projections. If the scientific and technical capacity for robust climate modeling is not strengthened, MPWT's investments risk being inadequate against escalating climate impacts, potentially compromising the long-term integrity of national adaptation efforts.

The institutional framework firmly places the Ministry of MAE at the apex of climate change governance. MAE holds the primary mandate to lead and coordinate national climate change responses and is designated as the UNFCCC National Focal Point. Furthermore, MAE is mandated with direct management and regulatory oversight of natural resources and the environment, including management of climate change, disaster, meteorology, and hydrology throughout the country.

The operational arm of MAE is the Department of Environment (DoE), which serves as the operational secretariat for national climate planning. The DoE spearheads the formulation of key planning documents, such as the NAP, and is recognized as the Designated National Authority (DNA) for climate finance mechanisms. Crucially, MAE is tasked with developing the necessary data and information systems. This includes the mandate for conducting vulnerability assessments and mapping processes, which are foundational prerequisites for supporting effective adaptation actions across all sectors, including MPWT's infrastructure planning.

6. Urban Development and Transport policy framework and legislation

MPWT's urban development policies and plans are nested within broader national strategies, most notably the National Socio-Economic Development Plan (NSED) and the National Strategy on Climate Change.

Table 5: Legislation Framework for Urban Development and Transport sector in Lao PDR

Legislation frameworks	Key focus /contribution
Land Law - No. 70/NA (1997, amended 2019)	Sets out the principles, regulations and measures for the management, protection, development and use of land, aiming to improve livelihoods, ensure peace and social security, and contribute to national socio-economic development.
Law on Urban Planning - No. 03-99/NA (1999, amended 2017)	Provides the legal framework for urban planning activities, elaborating, evaluating, approving and adjusting urban plans to guide land-use, construction and urban development in line with national socio-economic strategies
Land Transport Law – No. 35/NA (1997, amended 2021)	Defines the regime for administration, organization and operation of domestic, international and cross-border land transport of goods and passengers, aimed at efficient and safe mobility supporting Laos's role in regional connectivity and socio-economic development.

Public Roads Law – No. 04-99/NA (1999, amended 2017)	Define the planning, design, construction, use, maintenance and management of public roads, ensuring year-round connectivity between provinces, urban and rural areas, while contributing to national socio-economic development and integration with neighboring countries
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Key elements under MPWT's mandate and related to urban development include:

Five-Years Development Plan of Ministry of Public Works and Transport. (e.g., 2021-2025): This plan sets out strategic programs to achieve national goals, including sustainable, green, inclusive, and resilient growth.

- Program 6 specifically focuses on the Development of environmentally smart city plans.
- Program 7 covers the Development of water supply and sanitation.
- Program 8 addresses the Development of resilience infrastructure to mitigate climate change impacts.

Strategy on Housing and Urban Development toward 2030: This is a key sector-specific strategy aiming to achieve the 2035 Vision and has a focus on mainstreaming climate resilience into urban development.

- Developing a National Building Code: In partnership with international bodies like the Japan International Cooperation Agency (JICA), the MPWT is developing a modern national building code. This aims to standardize construction, improve building safety, and ensure climate resilience.
- Focus on "Resilient Housing": The primary housing initiative, supported by partners like UN-Habitat, is the "Enhancing Adaptive Capacity and Building Resilient Housing" project.
- Water & Sanitation Plan: The "2026–2030 Urban Water Supply and Sanitation Development Plan" is a key implementation arm of the strategy. Its central goal is to achieve 90% urban water access by 2030, alongside reducing water loss and increasing wastewater treatment capacity as indicated in strategy on urban water supply and sanitation development toward 2035.
- Sustainable Transport: Master plans, particularly for Vientiane, aim to integrate a Bus Rapid Transit (BRT) system and promote electric mobility, with a national goal of 30% EV use by 2030.
- "Smart City" Initiative: Vientiane, Luang Prabang, Kaysonaphomvihan and Pakse are designated as "Smart City" pilots, focusing on using technology to improve infrastructure management, transport, and public services.

PART IV: LAO PDR SECTORAL ADAPTATION STRATEGY AND ACTION PLAN FOR THE URBAN DEVELOPMENT AND TRANSPORT SECTOR 2026-2030

1. Introduction and Strategic Goal

The SAP-UrT provides sector-specific guidance necessary to operationalize commitments made under the NAP and NDC frameworks, thereby complementing both national policies. Grounded in the findings of the CRVA, the SAP-UrT identifies and prioritizes adaptation actions aligned with Lao PDR's national development goals and tailored to the specific needs of its rapidly growing urban areas and transport systems. It outlines investment options that strengthen climate-resilient infrastructure, reduce exposure to hazards, and enhance community resilience, with a strong emphasis on GEDSI to ensure equitable benefits for all population groups.

The **overarching goal** of the SAP-UrT is to enhance the resilience and sustainability of urban and transport systems in Lao PDR by ensuring that cities and mobility networks are safe, inclusive, and adaptive to the impacts of climate change. Through evidence-based planning and multi-stakeholder engagement, the SAP-UrT aims to support sustainable urbanization, low-carbon transport, and improved access to essential services for all.

As a strategic tool for resource mobilization, the SAP-UrT provides a credible framework to attract domestic and international climate finance, as well as private-sector investment in climate-resilient infrastructure, urban services, and green mobility solutions. The strategy supports the Government's ongoing efforts to integrate climate adaptation into urban planning, land use, and transport policies, reinforcing national resilience objectives.

The SAP is structured around three overarching outcomes that organize the 15 priority actions:

- **Outcome 1:** Resilient Urban Infrastructure and Services
- **Outcome 2:** Sustainable Mobility Systems
- **Outcome 3:** Restored and Well-Managed Urban Ecosystems

2. Action Plan for the Urban Development and Transport Sector

The main goal of the SAP-UrT is to foster a climate-resilient, sustainable, and equitable urban environment where infrastructure, mobility, and ecosystems work in harmony to protect citizens and enhance quality of life. This plan moves beyond traditional development by deeply integrating climate adaptation (Outcomes 1 & 3) with climate mitigation (Outcome 2) and social equity (Outcome 2).

Outcome 1: Resilient Urban Infrastructure and Services

This outcome focuses on strengthening the physical "hardware" of the city to withstand and recover from climate-related shocks, particularly flooding. It is the foundational defense mechanism for the urban area. This outcome directly protects lives, property, and the economy. By ensuring infrastructure doesn't fail, the city avoids catastrophic service disruptions, limits economic damage, and provides a secure foundation for its citizens.

Strategic Objective 1.1: Strengthen climate-proof urban planning and building standards

Enhance planning regulations and building codes so that new and existing infrastructure is adapted to climate risks. However, the objective is not specifically regulation but beyond it. Building Standards: This element ensures that new construction is built to last. It means updating building codes to require flood-resistant materials in basements, elevating critical electrical systems, or mandating structural integrity for high winds. For existing buildings, it involves retrofitting standards.

Climate-Proofed Public Facilities: This is about service continuity. Critical facilities like hospitals, emergency response centers, schools, and water treatment plants must remain operational during a disaster. This outcome would fund actions like installing backup power, constructing flood barriers around hospitals, or relocating key assets out of high-risk zones.

Strategic Objective 1.2: Improve urban drainage and flood protection systems

Expand, modernize, and maintain drainage networks, integrating nature-based solutions for effective flood control. Drainage and Flood Protection: This involves moving beyond simply building bigger drains. It means creating an integrated water management system. This could include "grey" infrastructure like upgraded storm sewers, levees, and retention ponds, combined with monitoring systems for early warnings.

Outcome 2: Sustainable Mobility Systems

This outcome addresses the "lifeline" of the city: how people and goods move. It aims to create a transport network that is clean, efficient, and accessible to everyone, even in the face of climate challenges. Because currently urban transport systems are vulnerable to floods, heat, and landslides. At the same time, fossil-fuel dependence worsens pollution and emissions. Shifting to low-carbon, resilient mobility ensures safer, cleaner, and more inclusive transport. It connects resilience with sustainability and equity. It tackles climate change (less-polluting vehicles) while ensuring the *entire* population can benefit from and access the city's economic and social opportunities, even during difficult times.

Strategic Objective 2.1: Promote low-carbon and resilient public transport systems

Invest in public transport systems that reduce emissions and remain functional under climate stress with two focuses as 1. Climate-Resilient Public Transport: This ensures the mobility network itself can survive a climate event. It means designing bus routes that avoid flood-prone areas, protecting depots and maintenance yards from damage, and ensuring vehicles (e.g., buses, trains) can operate in extreme heat or heavy rain. 2. Low-Emission Vehicles: This is the plan's primary climate mitigation strategy. By shifting the public and private fleet (e.g., city buses, taxis, delivery vans) to electric or other low-emission technologies, the city directly reduces its carbon footprint and improves local air quality. This also includes building the necessary charging infrastructure.

Strategic Objective 2.2: Strengthen transport resilience through planning and innovation

Ensure transport assets and networks are adapted to climate risks through better planning and risk-informed investment. Mobility for Vulnerable Users: This is the equity component. A transport system is only successful if it serves everyone. This focuses on ensuring that low-income households, the elderly, people with disabilities, and those in remote neighborhoods have reliable and affordable access to transport for jobs, healthcare, and education. This could mean safe, well-lit pedestrian paths, accessible buses, and subsidized fare structures.

Outcome 3: Restored and Well-Managed Urban Ecosystems

This outcome represents the plan's "green infrastructure" or Nature-Based Solutions (NbS) strategy. It recognizes that natural systems, when healthy, provide essential services that are often more effective and less expensive than purely engineered solutions. Because urban ecosystems (wetlands, rivers, green areas) provide flood buffering, cooling, and biodiversity benefits but face degradation from poor waste management and urban sprawl. This outcome makes the entire plan more sustainable and cost-effective. By integrating nature into the urban fabric, the city creates a resilient system that is self-sustaining, enhances biodiversity, and directly improves the daily quality of life for its residents. It's the key to making a city not just survive climate change but thrive. In the same times, preventing and reducing the pollution from the waste management.

Strategic Objective 3.1: Conserve and restore urban ecosystems and natural buffers

Protecting and Restoring Wetlands, Lakes, and Green Areas: This component is about using nature as infrastructure. Wetlands, for example, act as giant natural sponges, absorbing and slowly releasing stormwater, which naturally reduces urban flooding. This is a direct complement to the "grey" infrastructure in Outcome 1. Natural Flood Regulation: Instead of only building concrete channels, this outcome would promote actions like restoring riverbanks (riverine restoration), creating urban parks that are designed to temporarily hold water (green "sponge parks"), and planting urban forests.

Strategic Objective 3.2: Strengthen sustainable waste management systems

To modernize waste systems to reduce pollution, improve public health, and support circular economy models. Strengthening regulations, enforcement and demonstration of different types of waste management system in the urban area to ensure that solid waste, wastewater or chemical waste are properly management and treated.

About the Sector Action Plan

The identification of priority actions under Urban Development and Transport SAP followed a structured and evidence-based process combining technical analysis, benchmarking, and stakeholder validation. An initial long list of adaptation measures was extracted from the NAP–UNEP adaptation catalogue and selected based on the MCA and findings from the CRVA and further refined through stakeholders' consultation.

The cost estimates presented in the SAP are indicative and intended to support strategic planning and prioritization. They are not detailed engineering budgets but aims provide realistic order-of-magnitude estimates to guide decision-making and resource mobilization. Costing was developed based on three main sources:

- Consultant experience: Cost estimates were informed by lessons learned and indicative budget ranges from similar climate adaptation, infrastructure, capacity-building, and institutional strengthening projects implemented in Lao PDR and comparable Southeast Asian contexts, including projects supported by ADB, World Bank, GCF and bilateral cooperation partners
- Benchmarking and literature review: Review of cost data from comparable national and donor-funded projects (ADB, World Bank, GCF, UN agencies, bilateral cooperation), including infrastructure rehabilitation, ecosystem restoration, policy reform, and capacity development initiatives
- Market-based assumptions: Use of standard unit costs where available (e.g., km of drainage, number of monitoring stations, training workshops, technical studies), adjusted to reflect the Lao context, logistical constraints, and inflation trends.



These estimates are to be further refined during detailed project preparation, feasibility studies, and engineering design phases.

Table 6: Urban Development & Transport Action Plan

Actions	Description	List of activities	GEDSI Integration	Stakeholders to support the implementation	Example of existing or under funding Projects	Cost	Schedule
Overarching goal: PROMOTE INCLUSIVE, SUSTAINABLE, AND CLIMATE-ADAPTIVE URBAN DEVELOPMENT AND TRANSPORT SYSTEMS THAT SAFEGUARD PEOPLE AND ECOSYSTEMS WHILE SUPPORTING RESILIENT GROWTH.							
Outcome 1: Climate-resilient urban infrastructure systems							
Rationale: Urban areas in Lao PDR are highly exposed to floods, landslides, and heat stress. Poor drainage, inadequate building codes, and uncontrolled expansion into risk-prone areas make infrastructure vulnerable. Investing in climate-proof infrastructure reduces risks and ensures urban safety.							
Coherence with NAP & national strategies: This outcome reflects NAP priorities on resilient infrastructure and DRR, the NDC's commitment to reduce climate losses, and MPWT's Urban Development Strategy 2030. It is aligned with the 9th NSED's goal to strengthen public infrastructure resilience.							
Strategic objective 1.1: Strengthen climate-proof urban planning and building standards							
Description: Enhance planning regulations and building codes so that new and existing infrastructure is adapted to climate risks.							
1. Update and enforce building codes for climate resilience <i>(Concept Note 1)</i> <i>- To be implemented jointly with Action 2</i>	Revise and enforce building codes to address climate risks such as floods, heatwaves, and landslides. Integrate hazard mapping, compliance audits, and municipal engineer training into urban planning systems.	Draft revisions (2026). Develop and disseminate technical design manuals and model construction guidelines (2026-2027) Provincial training courses (2027–2029). Set up inspection & compliance sections in Provincial DPWT's, enforcement pilots in 3 cities (2027-2029) Integrate climate-resilient design into vocational and university curriculum (2028-2029)	At least 35% of inspectors and engineers trained are women.	MPWT, MAE, Provincial DPWTs, National Assembly.	<i>UN-Habitat "Resilient Building Codes"; JICA technical cooperation.</i>	\$2.5M	2026–2039
2. Develop and disseminate technical	Produce manuals on flood-resistant construction, slope stabilization, and climate-	Draft manuals (2026). Conduct workshops in three targets districts (2027).	Include accessibility and gender-sensitive design criteria in infrastructure	MPWT, Academic Institutions,	<i>ADB "Resilient Infrastructure Guidelines."</i>	0.5M	2026–2028

manuals for resilient infrastructure <i>- To be implemented jointly with Action 1</i>	proof materials; translate into Lao and ethnic languages. Integrate into universities and training centers.	National rollout (2027–2028).	standards and ensure at least 30% female participation in training and manual review workshops.	Engineering Associations.			
Strategic objective 1.2: Improve urban drainage and flood protection systems							
Description: Expand, modernize, and maintain drainage networks, integrating nature-based solutions for effective flood control.							
3. Collect and manage urban flood risk and drainage data	Install gauges and flow sensors, create GIS flood maps, and build open-access databases for planners and citizens.	Assess existing drainage data and monitoring systems in 6 cities (2026) Develop standardized data collection templates and tools (2026-2027) Establish a national GIS-based urban flood and drainage database (2027) Train provincial and municipal staff on data entry, use, and maintenance (2027-2028)	At least 40% of provincial and municipal train staff are women	MAE Hydro-Met, MPWT, Universities, Cities.	<i>Mekong River Commission hydro-met network.</i>	1.6M	2026–2028
4. Upgrade and expand stormwater drainage systems in priority cities <i>- To be implemented jointly with Action 5 and 11</i>	Rehabilitate and extend drains, culverts, and retention ponds. Include climate projections and establish O&M manuals and seasonal community clean-ups.	Conduct hydrolysis studies and create drainage maps (2026) Conduct detailed studies in 4 test cities as a basis for design. (2026). Design and built / restore Drainage Systems (2026-2027) Upgrade 20 km of main and secondary drains (2027-2029) Install silt traps and vegetative retention zones (2028-2029) Develop maintenance guidelines and train municipal workers (2029-2030)	Prioritize flood-prone low-income neighborhoods where vulnerable and women headed households are most affected (ensure at least 40% of women headed household in project beneficiaries)	MPWT, Cities (Vientiane, Savannakhet, Luang Prabang), MAE.	<i>ADB Vientiane Urban Dev.; WB Green Cities.</i>	\$8.2M	2026–2030
5. Conserve urban ponds, swamps, and	Protect and restore wetlands/ponds as flood retention areas. Activities:	Conduct ecosystem surveys and create GIS maps to identify the location and area of all lakes in Bulimati city (2026).	FPIC in consultations and at least 50% of the	MAE (Water, Biodiversity),	<i>WWF “Urban Wetlands”;</i>	\$8.7M	2026–2031

wetlands for flood buffering (Concept Note 2) <i>- To be implemented jointly with Action 4 and 11</i>	legal designation, urban park development, pilot “wetland cities.”	Designation of Legal Protected Zones: in the Municipal Land Use Blueprint to prevent encroachment (2026-2027) Implement pilot restoration projects with native vegetation buffers in wetland zone and create green parks (2027-2029) Establish & train inclusive co-management committees (2027-2029) Develop and mobilize sustainable finance plan (2030).	pilot project are community led and co-managed.	MPWT, NGOs, Cities.	<i>ASEAN NBS initiatives.</i>		
Outcome 2: Adaptive and sustainable urban mobility systems							
Rationale: Urban transport systems are vulnerable to floods, heat, and landslides. At the same time, fossil-fuel dependence worsens pollution and emissions. Shifting to low-carbon, resilient mobility ensures safer, cleaner, and more inclusive transport.							
Coherence with NAP & national strategies: Aligned with NAP goals on resilient infrastructure, the NDC’s emission-reduction targets, and the National Transport Strategy 2025–2030’s focus on low-carbon public transport.							
Strategic objective 2.1: Promote low-carbon and resilient public transport systems							
Description: Invest in public transport systems that reduce emissions and remain functional under climate stress.							
6. Invest in electric buses, trains, and renewable-powered public transport (Concept Note 3) <i>- To be implemented jointly with Action 1</i>	Deploy electric buses and trains with renewable-powered depots; incentivize operators; integrate into mobility plans.	CRVA dedicated to transport systems (2026) Develop adaptation plans for critical transport infrastructure (2026). Feasibility studies for e-mobility integration in 3 pilot cities (2026). Deploy pilot electric bus fleets and charging stations in pilot cities (2027-2030). Train drivers, maintenance staff and operators (2028-2030)	100% of feasibility studies integrate assessment on the impacts on women’s mobility and accessibility and at least 30% of trained staff are women.	MPWT (Transport Dept.), Cities, MAE Energy, Private sector.	<i>ASEAN e-bus pilots; WB Low-carbon Transport.</i>	\$13.35M	2026–2030

7. Reduce transport-related pollution and GHG emissions	Introduce emission standards, modernize inspection systems, promote modal shift (buses, trains, bicycles).	Conduct baseline air-quality and GHG emission inventory in 6 urban centers (2026). Develop and adopt national emission standards for vehicles and fuels (2026-2027) Establish permanent air-quality monitoring stations in 3 pilot urban centers (2027) Promote modal shift campaigns (cycling, walking, car-free zones) (2027-2028)	100% of the awareness campaign have been co-designed and developed with the support of LWUs and LYUs and disability association and 100% of training includes gender sensitive modules and are available in ethnic languages with inclusive formats for illiterate persons.	MPWT, MAE, Traffic Police, Cities.	<i>JICA Air Quality Control; ASEAN GHG reduction programs.</i>	\$4.25M	2026–2030
Strategic objective 2.2: Strengthen transport resilience through planning and innovation							
Description: Ensure transport assets and networks are adapted to climate risks through better planning and risk-informed investments.							
8. Assess climate impacts on transport systems <i>- To be implemented jointly with Action 9</i>	Conduct vulnerability assessments of major roads, bridges, and transport hubs; integrate results into engineering manuals.	Conduct vulnerability assessments for major transport corridors and urban mobility networks (2026). Develop GIS-based database for asset exposure and sensitivity (2026-2027) Develop engineering design standards manuals (2027-2028).	At least 30% of provincial technical officers trained in data collection and database updating are women	MPWT Roads Dept., MAE Hydro-Met, Consultants.	<i>WB “Transport Resilience” program.</i>	\$1.2M	2026–2028
9. Prepare adaptation plans for critical transport infrastructure <i>- To be implemented jointly with Action 8</i>	Develop contingency and adaptation plans for roads, bridges, and airports. Include emergency detours, maintenance protocols, and drills.	Identify priority roads, bridges, and urban corridors at high risk (2026). Prepare costed adaptation plans and monitoring indicators (2027) Prepare a transportation master plan (2027-2028)	100% of adaptation plans including gender-responsive and community benefit indicators	MPWT, Provincial DPWTs, Police, Health.	<i>ASEAN DRM toolkits.</i>	\$1M	2026–2029

		Develop and Investment Mobilization and Financing Strategy for Climate Resilient Transport Infrastructure (2029)					
Outcome 3: Healthy and sustainable urban ecosystems							
Rationale: Urban ecosystems (wetlands, rivers, green areas) provide flood buffering, cooling, and biodiversity benefits but face degradation from poor waste management and urban sprawl.							
Coherence with NAP & national strategies: This outcome reflects NAP/NDC priorities for ecosystem-based adaptation and MoNRE's 2021–2025 plans on urban environment. It also supports MPWT's urban environment strategy and the Forest Strategy 2035–2030.							
Strategic objective 3.1: Conserve and restore urban ecosystems and natural buffers							
Description: Protect and rehabilitate wetlands, ponds, and green areas to enhance resilience and urban livability.							
10. Designate and protect high-risk urban areas (no-build zones)	Establish zoning regulations for floodplains and unstable slopes; enforce no-build areas.	Map flood- and landslide-prone zones in major cities (2026) Draft and adopt urban zoning by-laws restricting new construction in 6 cities (2027-2029)	FPIC is systematically collected and reported from local communities on each site and 100 % of affected households consulted and compensated fairly	MPWT, MAE, Provincial Authorities.	<i>UN-Habitat zoning pilots.</i>	\$0.9M	2026–2029
11. Restore and manage wetlands, ponds, and riversides <i>- To be implemented jointly with Action 3</i>	Reforest riparian zones, clean rivers, and rehabilitate ponds; integrate green parks.	Identify 5 priority urban areas for pilot programs Conduct ecosystem inventory and classify wetlands by ecological function (2026) Design and implement 2 restoration pilots' program per urban areas (native vegetation, riparian buffers). Develop management plans with local authorities and communities. Promote eco-tourism and livelihood diversification around restored sites.	At least 40% of enumerator and technical staff are women. FPIC is systematically collected. At least 40% of women among community members	MAE, MPWT, NGOs, Cities.	<i>WWF/MRC wetland restoration.</i>	\$10M	2026–2030

			participating in site restoration activity				
Strategic objective 3.2: Strengthen sustainable waste management systems							
Description: Modernize waste systems to reduce pollution, improve public health, and support circular economy models.							
12. Improve and build model landfills in cities	Upgrade landfills with leachate treatment, methane capture, and recycling facilities.	Identify 3 cities for pilot programs Assess existing landfill conditions and identify priority rehabilitation sites (2026) Design model sanitary landfills (2026-2027) Construction works (2027-2030) Train municipal staff on waste segregation and recycling systems (2028-2030)	At least 30% of construction workforce are local community members, with 20% women employed in non-manual roles	MPWT, MAE, Municipalities, Private operators.	<i>ADB solid waste management projects - Vang Vieng, Luang Namtha</i>	\$28.5M	2026–2030
13. Integrate climate-smart standards for urban environmental management	Update regulations on waste, stormwater, and green areas; mainstream ecosystem services in permitting. Support enforcement of regulations.	Review and revise existing regulations on waste, drainage, and green infrastructure to include climate-resilient standards (2026-2027). Develop and disseminate updated permitting guidelines incorporating ecosystem-service valuation (2027). Train municipal staff, engineers, and developers on enforcement and compliance monitoring (2027-2028).	100% of reviewed regulatory documents integrating gender- and social-inclusion clauses 100% of training includes gender sensitive and responsive modules.	MAE, MPWT, Cities.	<i>ASEAN “Urban Environment Guidelines.”</i>	\$0.5M	2026–2028
14. Raise community awareness on ecosystem protection (Concept Note 4) <i>- To be implemented jointly with Action 15</i>	Conduct campaigns in schools, markets, and neighborhoods on waste reduction and wetland conservation.	Co-design awareness campaign materials and inclusive formats (2026) Integrate ecosystem protection and waste reduction modules into formal school curricula and official youth union activity plans (2026-2027)	At least 40% of the communication kits have been co-developed with the support of LWUs and LYUs and 100% of training includes gender	MoES, Cities, MAE, NGOs, LWU, LYUs, LFND.	<i>WWF community outreach pilots.</i>	\$0.5M	2026–2029

		Roll out targeted campaigns in schools, markets, and neighborhoods in wetland-proximate urban areas (2027-2029) Establish and manage seed funding and mentorship program for community-led micro-projects (2027-2029) Implement feedback mechanisms and report annually on participation data and impact (2029)	sensitive modules and are available in ethnic languages with inclusive formats for illiterate persons.				
15. Mobilize municipal investment for urban ecosystem protection <i>- To be implemented jointly with Action 14</i>	Develop investment programs for wetlands, drainage-linked green areas, and waste treatment facilities.	Pipeline developed (2026) Support integration of urban ecosystem financing into city master plans (2026-2027) Pilot co-financing models with private sector and community groups in 5 cities (2027-2030)	At least 50% of co-financing initiatives that include women's or community-based organizations as implementing partners	MPWT, MoF, MAE, Municipalities.	<i>GCF readiness programs.</i>	\$2.75M	2026–2030

3. Concept notes for climate change adaptation projects

To complement the Sectoral Action Plan and support resource mobilization for implementation, five concept notes have been developed under the Urban Development and Transport sector SAP. Each concept note translates a priority adaptation action into a potential investment-ready project proposal. The concept notes were formulated based on the results of the MCA (see [Appendix 2](#)), sectoral consultations (see [Appendix 3](#)), and alignment with Lao PDR's climate-related ODA projects (see [Appendix 4](#)). The concept notes provide a practical framework for future project development, capacity building, and funding engagement with national and international partners.

1 Action 1: Update and Enforce Building Codes for Climate Resilience

This action was moderately prioritized by the Department of Water Supply (DWS) and ranked highest by the Department of Waterway (DOW). It reflects the foundational need to strengthen urban infrastructure against climate hazards such as floods and heatwaves. The presence of ongoing projects like MaWaSU2 (2018–2023) supports its feasibility. However, enforcement challenges and limited provincial capacity may have tempered its ranking.

2 Action 4 & 5: Building Climate Resilience through Nature-based Solutions and Digital Hydrological Governance

On one hand, action 4 was prioritized by both DOW and DWS, reflecting growing recognition of nature-based solutions in urban flood management. While feasibility scores were moderate the lack of existing projects indicates a need for new investment and cross-sector coordination. On the other hand, action 5 was prioritized by the DWS this action supports evidence-based planning and infrastructure design. Its absence from DOW's priorities may reflect limited data management mandates. During SAP presentation workshop held in January 2025, stakeholders recommended to combine the two actions into one concept note to ensure the two actions are implemented in parallel as they can support each other.

3 Action 6: Invest in Electric Buses, Trains, and Renewable-Powered Public Transport

Prioritized only by DOW, this action reflects long-term ambitions for low-carbon mobility. However, feasibility scores were low, indicating limited current capacity, funding, or mandate alignment.

4 Action 14: Raise Community Awareness on Ecosystem Protection

Prioritized by the DWS this action reflects strong institutional support for inclusive, community-based adaptation. It supports GEDSI integration and complements ecosystem restoration efforts.

CONCEPT NOTE 1

Update and Enforce Building Codes for Climate Resilience

Rationale

Urban centers in Laos are increasingly vulnerable to climate-related disasters, including floods, landslides, and extreme heatwaves. Existing building codes and urban planning regulations are often insufficient to address these intensified risks, threatening public safety, property, and economic continuity. This action is essential to strengthen the foundational regulations that govern urban development, ensuring that new infrastructure, public facilities, and housing are designed and constructed to be resilient, safe, and durable in the face of a changing climate. It directly supports the strategic objective of strengthening climate-proof urban planning.

Locations of potential implementation

Building codes and construction standards in Lao PDR are primarily established at the national level under the authority of the MPWT.

However, their application and enforcement are delegated to local authorities (provincial DPWT and city offices).

Target Cities for enforcement pilot programs: Vientiane, Savannakhet, Luang Prabang as major city in Laos and mountain town and locates along riverbank like Samnua, Louang Namtha, Houay-Xay

Objectives

Strengthen climate-proof urban planning and building standards.

Specific Objectives:

- To revise and update national and municipal building codes (included laws and regulations) to integrate climate risks (floods, heat, landslides) based on modern hazard mapping.
- To build the capacity of municipal engineers, inspectors, and planners for effective compliance auditing and enforcement of the new codes.
- To develop and disseminate technical manuals to guide the construction of resilient infrastructure.
- To integrate climate-resilient design principles into technical vocational and university engineering curricula to ensure long-term sustainability.
- Effective building code-laws and regulation enforcement and turning plan to real actions

Schedule / Duration

Implementation: 2026–2029 (4 years)

Climate Risks Addressed

Floods: Damage to structures due to inadequate drainage and poor elevation planning.

Landslides: Structural instability on slopes and erosion-prone terrain.

Extreme Heat Events: Heat stress on buildings, increased cooling demand, and reduced habitability in dense urban zones.

Adaptation Finance and Innovation

Potential financing opportunities include climate-resilient urban infrastructure windows under the Green Climate Fund (GCF), bilateral technical assistance, and municipal resilience financing. Performance-based grants could incentivize local authorities to integrate and enforce resilient construction standards. Digital compliance tools, GIS-based hazard zoning, and climate-smart construction materials could further support cost-effective and scalable implementation.

Gender equity, Disabilities and Social Inclusion (GEDSI)

Participation: At least 35% of technical working group members should be women with leadership roles.

Consultation: Women-led CSOs and ethnic representatives should be formally consulted during the code revision and zoning update processes.

Auditing: Compliance audits should include GEDSI-sensitive criteria, such as physical accessibility for PWDs and safety/security features for the elderly and women.

Piloting: Enforcement pilots should report on GEDSI outcomes, explicitly monitoring housing safety improvements for female-headed households and residents of informal settlements.

Source of financing

MPWT / DPWT Budgets

Development partners:

Green Climate Fund (GCF): urban resilience and capacity building window

UN-Habitat/Cities Alliance: technical support for urban resilience

AFD / JICA / GIZ: potential for building upon the ongoing support to MPWT and urban management reform

Actions	Main activities	Timeline				Responsibility	Budget (USD)
		2026	2027	2028	2029		
Action 1: Update and Enforce Building Codes for Climate Resilience	1.1. Revise and update national building codes for buildings and public infrastructure to integrate resilience standards	X	X			MPWT/DPF, DHUP, DOR, DWS, DoE	350,000
	1.2 Develop and disseminate technical design manuals and model construction guidelines for resilient infrastructure	X				MPWT/DPF, DHUP, DOR, DWS, DoE	200,000
	1.3. Build capacity of municipal engineers, inspectors, and planners on compliance, auditing, and enforcement (trainings and workshops)		X	X		MPWT/DPF, DHUP, DOR, DWS, DoE	400,000
	1.4. Conduct municipal-level enforcement pilots in high-risk cities (Vientiane, Savannakhet, Luang Prabang).			X	X	MPWT/DPF, DHUP, DOR, DWS, DoE	600,000
	1.5. Integrate climate-resilient design into vocational and university curricula.			X	X	MPWT/DPF, DHUP, DOR, DWS, DoE	150,000
	1.5 effective building code-laws and regulation enforcement and turning planning into real actions			X	X	MPWT/DPF, DHUP, DoR, DWS, DoT, DWW, DRW	800,000
Requires Budget for Action 1							2,500,000

Recommendations for implementation – Next Steps / Additional information

This action is foundational for achieving Outcome 1 – Resilient urban infrastructure and services. By establishing and enforcing new standards, it ensures that all new construction (drains, public facilities, etc.) contributes to resilience.

The lead agency should be the MPWT through the Department of Housing and Urban Planning (DHUP). The immediate next step is to establish a formal Technical Working Group co-led by MPWT and municipal authorities, ensuring the 35% women participation quota is met from the outset.

The action could gain from partnerships with development institutions such as UN-Habitat and JICA to leverage their existing technical expertise and knowledge, share hazard mapping data, and align Methodology to maximize impact and cost-efficiency.

CONCEPT NOTE 2

Building Climate Resilience through Nature-based Solutions and Digital Hydrological Governance

Rationale

Rapid urbanization in Lao PDR's key cities is degrading critical "blue-green" assets (wetlands and swamps), which act as natural sponges. Concurrently, municipal planners lack the real-time data needed to manage stormwater, often relying on expensive and inflexible "grey" concrete infrastructure that fails during extreme climate events.

By combining **Nature-based Solutions (NbS)** with a **Digital Data Backbone**, this project moves cities from reactive crisis management to proactive, evidence-based resilience. This "Smart-Sponge" approach optimizes urban cooling, flood buffering, and biodiversity while ensuring every investment is validated by high-resolution GIS modeling.

Locations of potential implementation

Target Cities:

- **Tier 1 (Full Implementation):**
Luang Prabang, Pakse, Xayabouly (NbS + Data).
- **Tier 2 (Data Foundations):**
Vientiane, Luang Namtha, Oudomxay (Data focus).

Objectives

□ **Strategic Objective:** To build climate-resilient cities by integrating legally protected natural buffers with modern digital monitoring systems.

□ **Specific Objectives:**

1. **Digital Mapping:** To establish a monitoring network of sensors and high-resolution GIS flood maps to identify vulnerable populations.
 2. **Legal Protection:** To designate critical wetlands as "no-build zones" within urban land-use plans.
 3. **Ecological Restoration:** To physically restore the hydrological functions of degraded swamps and pilot green infrastructure like bioswales.
- **Inclusive Governance:** To empower communities through "Citizen Science" and co-management models (≥30-40% women and youth representation).

Schedule / Duration

5 years program 2026-2030

Climate Risks Addressed

Primary: Urban flooding, flash floods (pluvial and fluvial).

- Data gaps in rainfall and drainage
- Drainage system overload / failure
- Inadequate preparedness due to lack of monitoring systems
- Poor coordination in maintenance and planning

Secondary: Urban heat island effect, water scarcity (through improved groundwater recharge).

Adaptation Finance and Innovation

This project could be well suited for blended finance approaches combining ecosystem-based adaptation finance, urban resilience investments, and digital innovation funding. Potential mechanisms include natural capital financing, resilience bonds, and climate adaptation windows supporting NbS implementation. Innovation opportunities include "Smart-Sponge City" approaches, open-access hydrological data platforms, citizen science monitoring systems, and nature-based drainage infrastructure reducing long-term maintenance costs compared to grey infrastructure alone.

Gender equity, Disabilities and Social Inclusion (GEDSI)

This action is built on an inclusive, rights-based foundation to ensure equitable benefit-sharing and empowerment:

- **Inclusive Governance:** Co-management committees for wetland sites should include ≥30% women, ethnic groups, and youth, with decision-making authority over restoration priorities and land-use agreements.
- **Community Rights:** Free, Prior, and Informed Consent (FPIC) protocols should be applied in all restoration zones, with documented consent and feedback loops from affected communities.
- **Economic Empowerment:** Restoration contracts should prioritize local women's groups and youth cooperatives for planning, nursery management, maintenance, and related eco-tourism services.
- **Disaggregated M&E:** Monitoring reports should disaggregate all benefits by gender, age, and disability status.

Source of financing

To be secured, focusing on blended finance.

- UNEP and GEF (Ecosystem-based Adaptation Facility)
- ADB Natural Capital Financing Facility
- GCF Ecosystem Resilience Program
- Adaptation Fund
- National and provincial funds

Technical Partners: WWF (for conservation and "wetland cities" expertise), academic institutions.

Actions	Main activities	Timeline					Responsibility	Budget (USD)
		2026	2027	2028	2029	2030		
Action 4: Conserve Urban Ponds, Swamps, and Wetlands for Flood Buffering Action 5: Collect and Manage Urban Flood Risk and Drainage Data	Install sensors/gauges & conduct drainage needs assessment.	X	X	X			DMH, DWR/MAE DHUP/DPF/DWW-MPWT	500,000
	Develop GIS flood models and risk maps.	X	X	X			DLAM/DWR-MAE DHUP/DPF/DWW-MPWT	400,000
	Map urban wetlands and legally designate "No-Build Zones"	X	X				DLAM/DWR-MAE DHUP/DPF/DWW-MPWT	200,000
	Develop urban wetland management guidelines	X	X	X			DLAM/DWR-MAE DHUP/DPF/DWW-MPWT	150,000
	Selection of pilot sites and collection of FPIC		X	X			DLAM/DWR-MAE DHUP/DPF/DWW-MPWT	500,000
	Implement NbS restoration (native buffers & bioswales).		X	X	X	X	DLAM/DWR-MAE DHUP/DPF/DWW-MPWT	4,500,000
	Launch open-access data dashboard for planners & citizens			X	X	X	DLAM/DWR-MAE DHUP/DPF/DWW-MPWT	450,000
	Publish annual urban flood risk reports.			X	X	X	DWR-MAE DHUP/DPF/DWW-MPWT	200,000
	Establish inclusive co-management committees			X	X	X	DWR-MAE DHUP/DPF/DWW-MPWT	800,000
	Train municipal staff and "Citizen Science" volunteers.			X	X	X	DWR-MAE DHUP/DPF/DWW-MPWT	1,000,000
Require Budget for Action 4 and Action 5								8,700,000

Recommendations for implementation – Next Steps / Additional information

Legal Synergy: The restoration efforts are contingent on the legal enforcement of **No-build zones** to prevent future encroachment.

Sustainability: The "Citizen Science" component lowers long-term data collection costs and builds community "buy-in" for the physical wetland protection.

CONCEPT NOTE 3

Invest in Electric Buses, Trains, and Renewable-Powered Public Transport

Rationale

Rapid urbanization in Laos' key cities necessitates a shift away from fossil fuel-dependent private transport, which is a primary source of GHG emissions and local air pollution. This action addresses this challenge by investing in a modernized, electrified public transport system. By deploying electric buses and trains powered by renewable energy and developing climate-resilient depots, this initiative promotes a low-carbon, efficient, and inclusive urban mobility system. It directly contributes to national decarbonization goals, enhances urban air quality, and ensures that mobility systems are sustainable and accessible to all residents, particularly vulnerable groups.

Locations of potential implementation

Vientiane, Kaysonphomvihan city
(Savannakhet Province),
Pakse city (Champasak province)

Objectives

Promote low-carbon and resilient public transport systems.

Specific Objectives:

- Deploy electric buses and potentially trains powered by renewable energy sources.
- Develop climate-resilient depots and charging infrastructure.
- Incentivize private and public operators to adopt low-emission fleets

Schedule / Duration

5 years projects 2026-2030

Climate Risks Addressed

This action directly mitigates urban heat island effects and transport-related emissions, which contribute to deteriorating air quality and higher ambient temperatures in cities. By shifting from fossil-fuel vehicles to electric buses and trains powered by renewable energy, the action reduces GHG emissions, lowers local air pollution, and decreases waste heat released by conventional engines.

Furthermore, improved and reliable public transport helps reduce private car dependency, indirectly lowering congestion and surface heat accumulation from impervious roads. In the long term, this contributes to cooler and healthier urban microclimates, reduced energy demand, and enhanced climate resilience of mobility systems against rising temperatures and fuel-price shocks.

Adaptation Finance and Innovation

Potential financing opportunities include green urban mobility funds, concessional climate finance, and Public–Private Partnerships (PPPs) for electric fleet deployment and charging infrastructure. Carbon finance and results-based financing linked to GHG reductions could also support scaling-up. Innovation opportunities include solar-powered charging stations, battery-swapping systems, integrated e-mobility platforms, and smart public transport systems improving operational efficiency and climate resilience.

Social and Gender equity

Governance: Public transport planning boards should include ≥30% women representatives on route design, fares, and accessibility.

Accessibility: All vehicles must meet universal design standards (ramps, priority seating, visual/audio alerts).

Affordability: Modal shift incentives (e.g., subsidies, passes) should prioritize low-income women, the elderly, and PWDs.

Accountability: GEDSI monitoring will include ridership data disaggregated by gender, age, and disability, with annual public reporting.

Source of financing

Potential financing will be explored through linkages with ongoing ASEAN e-mobility initiatives and low-carbon transport programs supported by development partners and regional banks. Key sources include the ADB Green Urban Mobility and Clean Transport Program.

Additional opportunities may arise through bilateral partners such as JICA, GIZ, and the EU Green Mobility Fund, as well as private sector participation via Public–Private Partnerships (PPPs) for e-bus fleet procurement and solar charging infrastructure development.

Actions	Main activities	Timeline					Responsibility	Budget (USD)
		2026	2027	2028	2029	2030		
Action 6: Invest in Electric Buses, Trains, and Renewable-Powered Public Transport	6.1 Assess climate impacts and vulnerabilities for transport systems in target cities (integrates Action 8).	X					DHUP/DoR/ DPF-MPWT DoE-MAE	150,000
	6.2 Develop adaptation plans for critical transport infrastructure (depots, routes) (integrates Action 9).	X					DHUP/DoR/ DPF-MPWT DoE-MAE	100,000
	6.3 Establish technical standards and procurement guidelines for e-buses, charging infrastructure, and renewable energy integration.	X	X				DHUP/DoR/ DPF-MPWT DoE-MAE	100,000
	6.4. Conduct feasibility studies for e-mobility integration in 3 pilot cities		X					600,000
	6.4 Deploy pilot 10 electric bus fleets and charging station in each pilot city.			X	X	X	DHUP/DoR/ DPF-MPWT DoE-MAE	10,000,000
	6.5 Design and implement incentive schemes for operators to adopt low-emission fleets.				X	X	DHUP/DoR/ DPF-MPWT DoE-MAE	1,500,000
	6.6. Train drivers, maintenance staff, and operators on e-mobility			X	X	X	DHUP/DoR/ DPF-MPWT DoE-MAE	400,000
	6.6 Establish monitoring, reporting, and verification systems for GHG reductions (Action 7)				X	X	DHUP/DoR/ DPF-MPWT DoE-MAE	500,000
Required Budget for Action 6								13,350,000

Recommendations for implementation – Next Steps / Additional information

This investment aligns with ongoing ADB green-mobility initiatives. The next important steps of the project would be to develop a develop an e-mobility roadmap linking national energy transition and climate goals and align the action and activities with ongoing low-carbon transport programs and explore financing windows.

CONCEPT NOTE4

Raise Community Awareness on Ecosystem Protection

Rationale

Effective urban ecosystem stewardship and sustainable waste management require active community participation and a fundamental shift in behavior. This action addresses the need for widespread public awareness and engagement in protecting vital urban ecosystems, particularly wetlands, which are critical for climate resilience. By conducting inclusive, co-designed campaigns in schools, markets, and neighborhoods, this initiative will build a culture of environmental responsibility, promoting practices like wetland conservation, waste reduction, and other climate-smart urban behaviors. This bottom-up approach is essential for ensuring the long-term success and community ownership of restoration and sustainable waste management efforts.

Objectives

Strengthen sustainable waste management and urban ecosystem stewardship.

Specific Objectives:

- Conduct inclusive awareness campaigns in schools, markets, and neighborhoods.
- Promote wetland conservation, waste reduction, and climate-smart urban practices.
- Integrate ecosystem protection concepts into school curricula and youth union activities.

Climate Risks Addressed

This action indirectly addresses climate risks by promoting behaviors that enhance ecosystem resilience (e.g., wetland conservation, which aids in flood mitigation and water filtration) and reduces environmental degradation (e.g., waste reduction). It is designed to build public support for and be integrated with other key climate actions, linking awareness directly to practical restoration and zoning initiatives (Actions 10, 11, 15).

Social and Gender equity

Leadership & Livelihood: Campaigns should be co-designed with LYUs, LWUs and LFND, with stipends and recognition provided for facilitators.

Accessibility: Aims for at least 50% women headed households' participation, promote the use of inclusive formats with ethnic language translations.

Locations of potential implementation

All urban centers with wetland proximity

Schedule / Duration

3 years : 2026 – 2029

Adaptation Finance and Innovation

Community-based adaptation grants, small-scale climate finance mechanisms, and GCF Readiness support could help scale awareness and ecosystem stewardship initiatives. Partnerships with civil society organizations, schools, and youth groups may support co-financing and long-term sustainability. Digital awareness campaigns, citizen reporting platforms, and community-led environmental monitoring systems could further strengthen participation and behavioral change outcomes.

Source of financing

Potential financing and technical partnerships can be explored through linkages with the WWF ongoing project to strengthen ecosystem-based resilience in urban areas.

Additional support may be mobilized through UNDP Small Grants Programme / GEF for community-based adaptation initiatives, and GCF Readiness grants to enhance institutional capacity and public awareness.

Accountability: Campaigns should feature feedback mechanisms (e.g., community scorecards, suggestion boxes) to ensure community voices inform future programming.



Actions	Main activities	Timeline				Responsibility	Budget (USD)
		2026	2027	2028	2029		
Action 14: Raise Community Awareness on Urban Ecosystem Protection	14.1. Co-design awareness campaign materials and inclusive formats (e.g., tactile, sign language) with LYUs, LWU, and LFND	X				DHUP-MPWT LWU, LYU, LFND DoE-MAE	50,000
	14.2. Integrate ecosystem protection and waste reduction modules into formal school curricula and official youth union activity plans.	X	X			MoEs, DoE-MAE LWU, LYU, LDNF	50,000
	14.3. Module & Teaching Material Development		X	X	X	MoEs, DoE-MAE LWU, LYU, LDNF	250,00
	14.4. Roll out parallel targeted campaigns in schools, markets, and neighborhoods in wetland-proximate urban areas.		X	X	X	DHUP-MPWT LWU, LYU, LFND DoE-MAE	100,000
	14.5. Establish and manage seed funding and mentorship program for community-led micro-projects (e.g., school gardens, waste brigades).			X	X	DHUP-MPWT LWU, LYU, LFND DoE-MAE	30,000
	14.6. Implement feedback mechanisms and report annually on participation data and impact.				X	DHUP-MPWT LWU, LYU, LFND DoE-MAE	20,000
	Required Budget for Action 14						500,000

Recommendations for implementation – Next Steps / Additional information

Immediate Next Steps: ○ Initiate formal partnership meetings with the LWUs and LYUs to map existing programs, identify synergies, and secure co-implementation commitments. ○ Establish a working group with the Ministry of Education and Sports by Q1 2026 to identify concrete entry points for integrating ecosystem protection into the national curriculum and youth union frameworks. It is important to ensure all campaign messaging is developed in close coordination with the teams for restoration (Action 10), waste management (Action 11), and zoning (Action 15) to provide communities with clear, consistent, and actionable steps they can take. And to integrate results into the national M&E system to track changes in community engagement and ecosystem conditions.
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PART V: MEASURE FOR IMPLEMENTATION, MONITORING, EVALUATION, AND REPORTING

1. Implementation

1.1. Institutional arrangements

The implementation of the SAP will follow the national climate governance framework established under the NAP.

- The Ministry of Agriculture and Environment (MAE), through the Department of Environment (DoE), will provide overall policy oversight, ensure alignment with national climate strategies, and coordinate reporting to the National Committee on Environment and the UNFCCC.
- The Ministry of Public Works and Transport (MPWT) will act as the lead implementing ministry, responsible for mainstreaming adaptation priorities into urban planning, transport infrastructure, drainage systems, and public investment programs.
 - Relevant MPWT departments, including Department of Waterways (DOW), Department of Roads (DOR), department of Transport (DOT), Department of Housing and Planning (DHUP), Department of Water Supply (DWS), Department of Railways, and Department of Planning and Finance (DPF) will integrate SAP-UrT actions into sectoral plans and oversee technical implementation at central and provincial levels.

As the lead institution, MPWT will collaborate closely with other ministries and agencies whose mandates intersect with urban development and transport resilience, including the Ministry of Agriculture and Environment and the Ministry of Industry and Commerce. These ministries contribute to areas such as land use, environmental management, disaster risk reduction, and urban service delivery, all critical for climate-resilient planning and implementation. Coordination will be supported through the Climate Change Technical Working Group to ensure coherence, data sharing, and progress tracking across institutions.

At the subnational level, Provincial and District Offices of Public Works and Transport (DPWT and OPWT) and Urban Service Management Offices (UMSOs) will play a central role in implementing and monitoring SAP-UrT actions. Their involvement will ensure that local adaptation priorities, climate risks, and infrastructure needs are adequately reflected. Coordination with urban municipalities, planning committees, and provincial disaster management offices will be essential to ensure that climate-resilient measures are mainstreamed across city planning and transport operations.

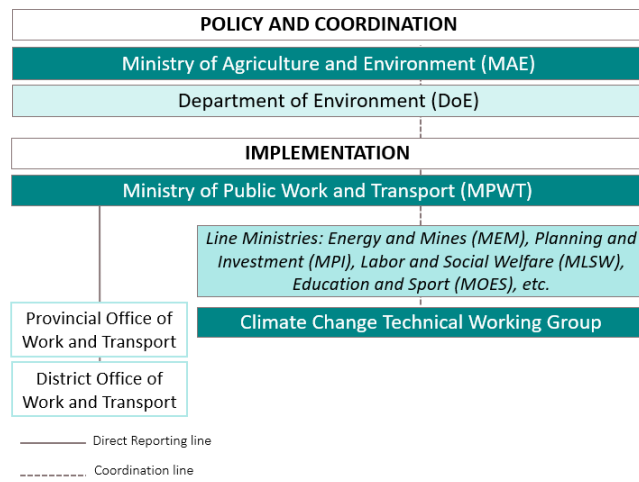


Figure 6: Institutional arrangement for the implementation of the SAP-UrT

National Coordination Mechanism of the Urban Development and Transport Sector

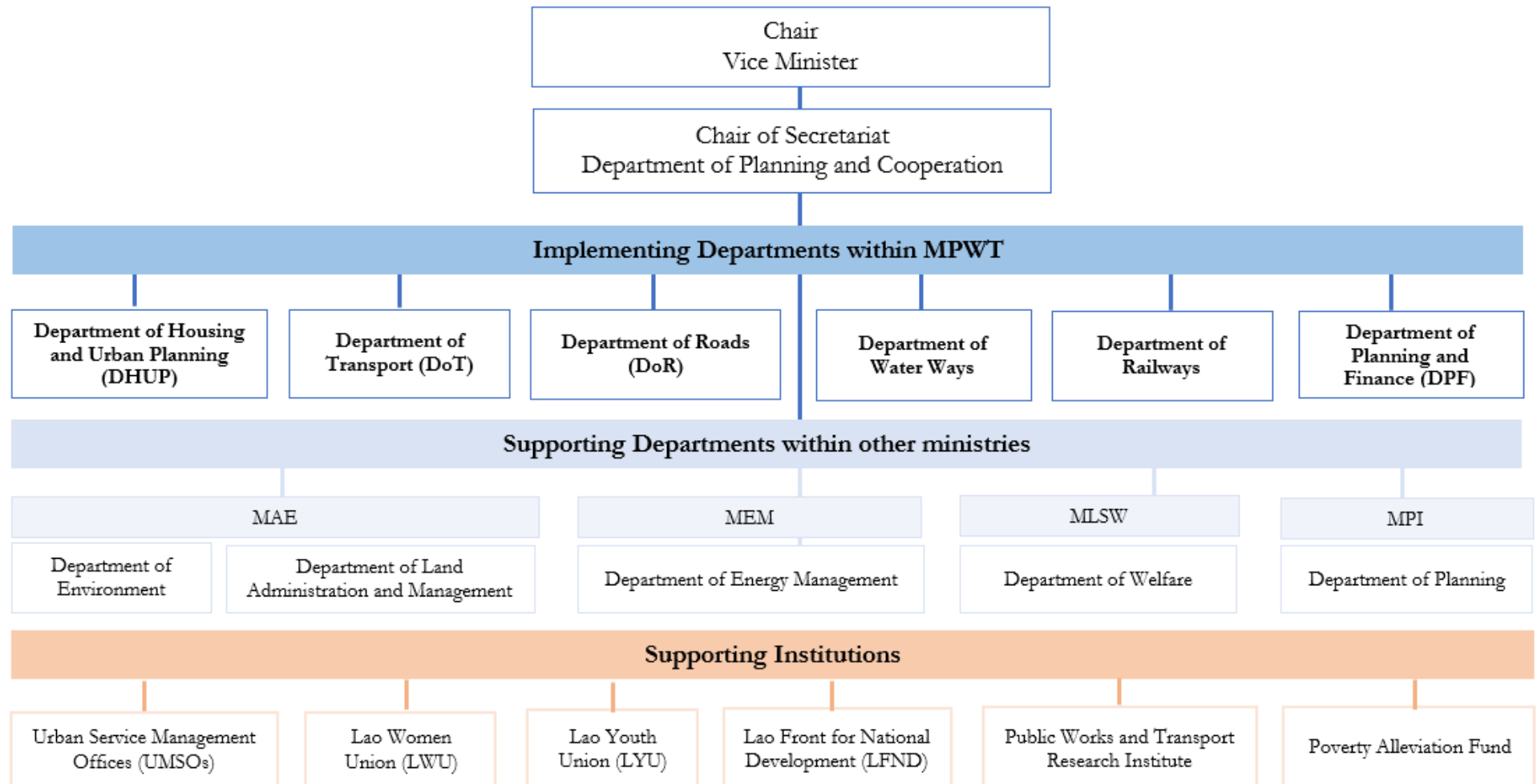


Figure 7: Detailed Institutional arrangement for the implementation of the SAP-UrT

Table 7: Roles and Responsibilities of participating institutions

Entity	Mandate	Roles in SAP-UrT Implementation
Prime Minister Office (PMO)	- Centrally and uniformly screens and provide no objections for all development projects financing from the private and ODA including climate change projects accepted by GOL (Ministry of Finance and line ministries) throughout the country. - Review and approve a Prime Minister's Decree which assign MAE the authority on behalf of the Lao government of direct responsibility on climate change and coordination with line ministries, organizations, and local authorities accordingly.	- Oversee the implementation of the SAP-UrT in close coordination with MAE, National Committee on Environment and line ministries. - Consider and adopt sectoral policies, strategic plans, regulations which contribute to the achievement of SAP- UrT targets.
MAE	- Develop policies, strategic plans, laws and regulations related to climate change and submit to GOL for approval. - Develop and maintain data and information systems on climate change in a reliable, accurate and timely manner.	- Act as focal ministry to provide oversight and advisory support to stakeholders including Technical Working Group for Climate Change (TWGCC) on the SAP- UrT implementation, including maintenance of data and information. - Develop policies, guidelines and regulations to support relevant ministries in setting sectoral priorities in line with SAP- UrT implementation. - Disseminate the SAP- UrT targets and priority actions to relevant sectors in central and local levels.
DOE	Coordinate SAP- UrT activities on behalf of MAE with other relevant ministries and local authorities.	- Coordinate SAP-AF activities including MRV. - Act as Secretariat of the TWGCC. - Take minutes of the TWGCC, endorsed SAP- UrT and priority action information to relevant sectors in central and local levels. - Lead in tracking progress of the SAP- UrT implementation plan and inform and advise the TWGCC and MAE.

Entity	Mandate	Roles in SAP-UrT Implementation
MPWT	Lead policy, regulation, planning and implementation for urban development, housing, roads, transport and infrastructure	- Lead implementation of SAP-UrT. - Mainstream climate resilience into urban planning, Building codes, Drainage systems, Transport infrastructure, Waste management through its different department (DHUP, DoR, DoT, DPF, etc.) - Integrate SAP-UrT into sector investment plans and budgets. - Coordinate provincial implementation. - Report progress to MAE/DoE.
Line Ministries	- Mainstream climate change into sectoral activities. - Conduct studies, research and promoting the use of environmentally friendly technologies that mitigate GHG emissions and/or increase resilience to climate change. - Coordinate and provide data and information on climate change from their sectors to the MAE and MPWT.	- Mainstream priorities for SAP- UrT implementation into its sectoral strategic and development plans. - Identify and execute sectoral climate actions that support the SAP- UrT implementation to MPWT - Support MRV of the SAP sector-related activities.
LWU	Representing Lao women in their development, protection of their rights and benefits including children's, promoting gender equality and involvement of women in the national development	- Ensure engagement of women in the project design and implementation, evaluation. - Provide perspectives on how the proposed projects may impact different gender of various ethnic groups.
Lao Front for National Development	- Responsible for conducting studies and researches as well as making records on each ethnic group profile; - Developing and monitoring policies related to all 52 ethnic groups in Lao PDR	- Participating in the project design, implementation and monitoring/reporting to ensure the inclusion of vulnerable and ethnic groups who may be impacted by the proposed project. - Support the ethnic language translation or communication with the elders according to the participating ethnic group's unique cultures.
Provincial Offices	- Implement and disseminate strategic plans, decrees and regulations related to climate change. - Monitor and inspect the implementation of climate change activities, and report to MPWT / MAE. - Direct the district office for implementation of climate change adaptation activities.	- Disseminate the importance of SAP and its implementation plan at the provincial, district. - Support the monitoring and reporting to MPWT / MAE on activities related to SAP implementation. - Collect provincial M&E data.
District Offices	Implement and disseminate strategic plans, decrees and regulations related to climate change.	Disseminate and advise the sub-district for awareness raising on SAP implementation.

Entity	Mandate	Roles in SAP-UrT Implementation
	- Advise and coordinate with sub-district for implementation and assessment of climate change activities and report to MAE. - Report to the PAE and district governors on climate change adaptation activities.	- Participate in activities related to climate change adaptation. - Monitoring and reporting to PAE on activities related to climate change adaptation and progress of SAP implementation.
UMSO	- Responsible for the operation and maintenance of municipal infrastructure and urban services, including drainage systems, solid waste management, local roads, and public spaces. - Implement local level adaptation measures and disseminate strategic plans, decrees and regulations related to climate change. - Advise and coordinate with sub-district for implementation and assessment of climate change activities and report to Provincial Offices. - Report to the Provincial offices on climate change adaptation activities.	- Operate and maintain drainage, waste and urban services. - Collect operational data. - Implement community-level resilience measures.
Village Authority	- Implement and disseminate strategic plans, decrees and regulations related to climate change. - Monitor and inspect the implementation of climate change activities. - Coordinate and report to the sub-district on climate change adaptation activities.	- Monitor and inspect climate change adaptation activities in its own area at the village level. - Implement community level activities that contribute the SAP implementation. - Coordinate with sub-district for updates and reporting. - Beneficiaries of community level activities.
Technical Working Group for Climate Change (TWGCC)	- Support MAE through the DoE on reviewing and providing technical inputs to policies, strategic plans and regulations related to climate change adaptation. - Coordinate with relevant sectors at central and local levels on the execution and dissemination of related policies and regulations.	- Provide technical review of sectoral policies, development projects and activities related to climate change and ensure the alignment with contribution to SAP implementation and report to PMO for consideration. - Invite and assign ad-hoc technical focal points to review particular reports for reporting to TWGCC. - Provide technical inputs and advice to DOE on the progress and results of SAP implementation.

Entity	Mandate	Roles in SAP-UrT Implementation
	Identify and propose effective actions to the government on climate mitigation and adaptation.	- Coordinate with line Ministries and development partners for information and knowledge sharing. - Propose priority actions for the achievement of SAP implementation. - Submit recommendations for approval or on SAP reports and updates.

Close coordination between MPWT, the National Steering Committee on Climate Change, and the National Environmental Committee, which oversee the overall NAP implementation, will ensure that the SAP-UrT remains aligned with national adaptation priorities. The strategy should be widely disseminated and discussed among government institutions, development partners, and civil-society stakeholders to foster ownership, coordination, and integration of its objectives across planning frameworks.

The National Environment Committee (NEC) could play a critical role in ensuring cross-sector coordination and high-level policy alignment in Lao PDR. Mobilizing the NEC for the implementation of the SAPs would help provide an institutional platform to integrate sectoral adaptation priorities into national planning frameworks and facilitate inter-ministerial dialogue, reduce duplication, and support coherent budgeting and regulatory reforms. Its oversight function also strengthens accountability and helps elevate adaptation from sector-specific initiatives to a coordinated national priority.

What is the National Environment Committee?

The National Environment Committee (NEC) in Lao PDR is a high-level inter-ministerial body responsible for coordinating and overseeing national environmental policy and management. It was established under the Environmental Protection Law, 2009 (revised 2012 and 2019). The NEC functions as the central policy coordination platform for environmental protection and sustainable natural resource management across sectors. It ensures that environmental considerations are integrated into national development planning. The NEC:

- Provides strategic direction on environmental and climate-related policies
- Oversees implementation of the Environmental Protection Law
- Coordinates across ministries on environmental matters
- Reviews and approves key environmental strategies and regulations
- Supports implementation of international environmental agreements
- Guides environmental impact assessment (EIA) frameworks and compliance

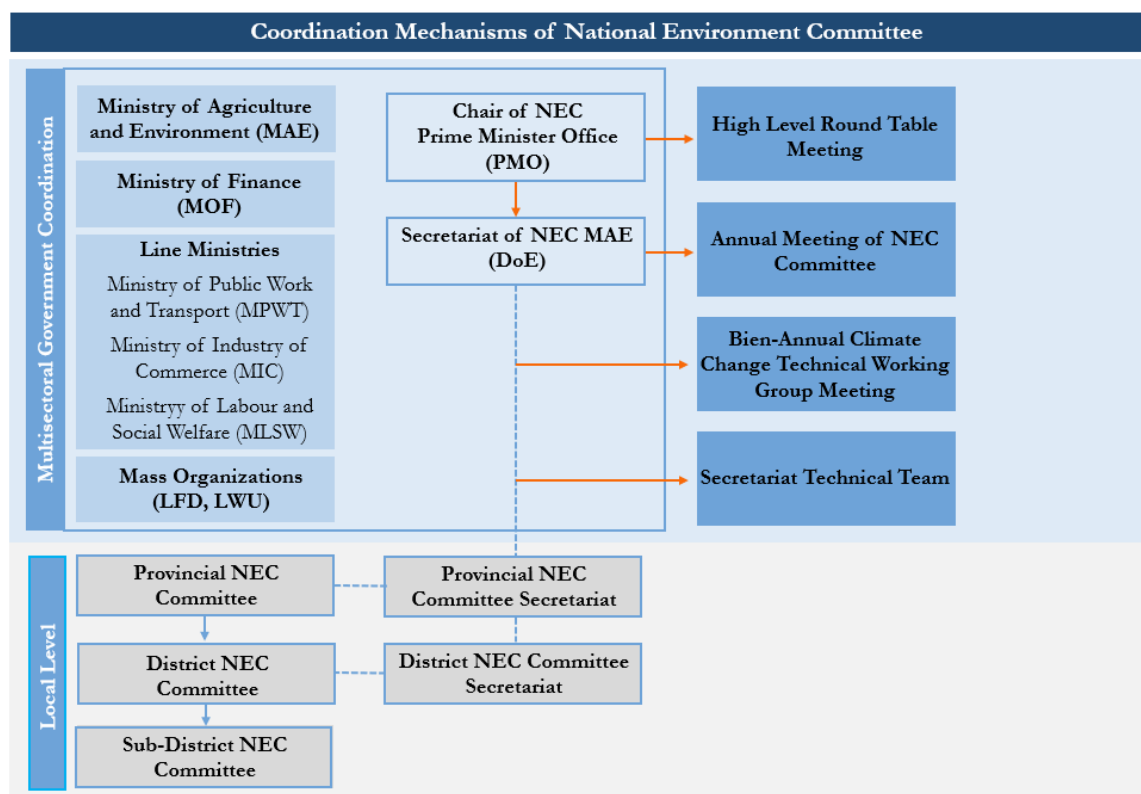


Figure 8: National and sub-national coordination mechanisms for National Environment Committee

Implementation will be carried out over a five-year period (2026–2030), based on the degree of urgency, availability of funding, and opportunities for alignment with national and international programs. Given the cross-cutting nature of the urban development and transport sectors, many SAP-UrT actions will be implemented through projects supported by both domestic budgets and Official Development Assistance (ODA).

Despite progress in institutional coordination and policy alignment, further strengthening is needed to ensure effective implementation of the SAP-UrT. Key recommendations include:

- Establishing a Climate-Resilient Urban and Transport Unit within MPWT to provide technical support, coordinate adaptation measures, and monitor progress across departments.
- Enhancing data-sharing protocols and digital systems across MPWT, MAE, and other ministries to improve early warning, urban risk assessment, and evidence-based planning.
- Building technical capacity at provincial and district levels (DPWT and OPWT) to enable localized implementation, stakeholder engagement, and GEDSI-sensitive adaptation delivery.
- Integrating climate and risk considerations into city and transport planning frameworks, ensuring that urban development plans, land-use zoning, and transport investments are aligned with adaptation goals.

Together, these institutional mechanisms will form the backbone of Lao PDR’s climate-resilient urban and transport governance system, enabling coordinated, inclusive, and adaptive responses to the growing challenges posed by climate change.

1.2. Funding

Lao PDR’s 10th National Socio-Economic Development Plan (NSED) prioritizes infrastructure expansion, urban modernization, connectivity enhancement, logistics development, and private sector participation as drivers of economic transformation [54]. However, while urban infrastructure development is recognized as a priority, the NSED does not establish a dedicated financing mechanism for climate-resilient urban development and transport systems. Fiscal space remains constrained, and public investment capacity is limited relative to the scale of infrastructure needs in secondary cities and rapidly urbanizing areas. Large-scale investments in roads, drainage, solid waste management, flood control, public transport systems, and climate-resilient building standards require capital beyond what public budgets alone can sustain. This creates a financing gap between climate-resilient urban infrastructure needs and available domestic resources.

Effective implementation of the SAP-UrT will therefore depend on mobilizing a diversified financing mix including:

- Domestic public resources (Government operational Budget and Public Investment Program)
- International development finance (ODA and climate funds)
- Non-ODA regional investment
- Private sector participation and PPPs

Table 8: Indicative Financing sources for SAP-UrT Action

Action Type	Likely Main source of Funding	Complementary sources
Policy Reform & Regulation	Government Budget	Technical assistance from ODA
Urban Infrastructure (drainage, roads, landfills, wetlands restoration)	Public Investment	Complementary Funds from PPPs Technical assistance from ODA
Public Transport & E-mobility	Public Investment	Complementary Funds from PPPs Technical assistance from ODA

Capacity Building	Government Budget	Technical assistance from ODA
Data Systems & Risk Mapping	Government Budget	Technical assistance from ODA

1.2.1 Domestic Public Financing

Urban and transport infrastructure in Lao PDR remains largely dependent on public budget allocations. The GoL remains the primary financier of sectoral investments through:

- Annual national budget allocations
- Sector ministry capital expenditure programs (MPWT and related departments)
- Provincial and municipal budget envelopes
- Public Investment Program (PIP)

Integrating climate risk screening into capital planning and maintenance budgets will be essential to prevent maladaptation and future asset losses. Additionally, mainstreaming SAP-UrT priorities into the Public Investment Program is critical for ensuring long-term sustainability and alignment with national infrastructure expansion.

1.2.2. International Development Finance

Given the strong alignment between SAP-UrT priorities and climate adaptation and mitigation goals, opportunities exist to mobilize:

International climate funding

1. The Green Climate Fund is a new global fund within the UNFCCC mechanisms, created to support the efforts of developing countries to respond to the challenge of climate change with both mitigation and adaptation actions. The GCF has funded 22 projects, completed 8 projects, being implemented 13 projects and in the pipeline 1 projects. As specific Lao PDR has 17 financial projects for 262.6 million USD and 10 readiness projects around 9.1 million USD ([Lao People's Democratic Republic \(the\) | Green Climate Fund](#))

2. The Adaptation Fund was established by the parties to the Kyoto Protocol of the UNFCCC to finance concrete adaptation projects and programmes in 45 developing countries that are parties to the Kyoto Protocol. Lao PDR has received fund from the adaptation fund for three grant projects with total cost 17,561,131 USD. ([Country – Adaptation Fund](#))

3. The Global Environment Facility is an international partnership of 183 countries, international institutions, civil society organizations, and the private sector that aims to address global environmental issues. The active portfolio has 5 national project for GET and 27 for regional and global projects including Laos ([Lao PDR | GEF](#)).

4. Two funds under the Global Environment Facility are the Least Developed Country Fund and the Special Climate Change Fund.

4.1. The Least Developed Country Fund was established to assist least developed countries to take quick actions including implementing projects identified under the National Adaptation Programme of Action to Climate Change.

4.2. The Special Climate Change Fund supports adaptation and technology transfer in all developing countries party to the UNFCCC. The Fund supports both long- and short-term adaptation activities in water resources management, land management, agriculture, health, infrastructure development, fragile ecosystems (including mountainous ecosystems), and integrated coastal zone management.

These funds are particularly relevant for large-scale transformational projects, readiness and institutional strengthening and innovation pilots. However, they typically require co-financing and cannot be the sole funding source.

Multilateral and Bilateral Development Coordination (Beyond Climate Funding)



Figure 9: Key international funding institutions active in Lao PDR Urban Development and Transport sector

1.2.3 Non-ODA Regional Investment and Private Sector

Lao PDR is increasingly integrated into regional economic corridors, logistics networks, and cross-border infrastructure systems, positioning the urban and transport sector at the center of regional connectivity and economic transformation. Beyond ODA, significant capital flows originate from foreign direct investment (FDI), regional infrastructure financing, state-owned enterprise investment, and private sector participation in transport, logistics, energy, and urban real estate development.

Large-scale transport and urban infrastructure investments, including highways, rail corridors (such as the Lao–China Railway), dry ports, logistics hubs, industrial parks, and Special Economic Zones (SEZs), are shaping urban expansion patterns and land development dynamics. Private sector participation is growing through different mechanisms with around 21 SEZs established across seven provinces attracting over USD 26 billion in private investment, industrial water use, wastewater management, and site drainage requirements are expanding alongside economic zone development. Under the 10th NSEDP, GoL continues to promote SEZs as key engines of industrialization and private sector-led growth to attract FDI [54]. These investments influence urban form, land values, mobility systems, drainage patterns, and exposure to climate risks. Ensuring that climate resilience standards, risk-informed spatial planning, and environmental safeguards are integrated into concession agreements and investment frameworks is therefore critical to prevent maladaptive urban growth and lock-in of future vulnerability.

Public-Private Partnerships (PPPs) in Lao PDR are increasingly recognized as a financing approach for transport and urban infrastructure [55]. With the PPP market emerging, policy frameworks and national regulation further support structured private participation in infrastructure delivery, including transport and urban service assets. In

2020, GOL introduced its first dedicated PPP regulation: the *Decree on Public-Private Partnership* (No 624/GOV, 21 December 2020) which sets out clear rules on investment requirements, structures and procedures for the proposals, bidding and awarding of PPP projects [56]. Leveraging the emerging PPP framework offers an opportunity to bridge financing gaps, enhance technical efficiency, and support the timely implementation of climate-resilient urban and transport investments under the SAP-UrT.

Private sector participation is also expanding in:

- Urban real estate development
- Industrial zone infrastructure
- Waste management and landfill operations
- Urban drainage and wastewater treatment
- Public transport services and vehicle fleets
- Renewable energy-powered mobility solutions

However, without strong regulatory oversight, risk-sensitive land-use planning, and enforceable climate standards, private and regional investments may inadvertently increase exposure to flooding, heat stress, congestion, or environmental degradation. Strengthening investment screening processes, climate risk disclosure requirements, green building codes, and resilience-based infrastructure standards is therefore essential to ensure that non-ODA financing contributes to long-term urban resilience rather than exacerbating systemic risks.

1.2.4. Community Level and Decentralized Financing

At the local level, urban resilience often depends on decentralized financing mechanisms, especially for:

- Drainage maintenance
- Community-based flood management
- Local road upgrades
- Solid waste management
- Informal settlement upgrading

However, financial resources at the municipal level remain limited. Maintenance budgets are often insufficient, and cost recovery mechanisms (e.g., user fees, waste collection fees, drainage fees) may be weak

Strengthening decentralized financing for urban resilience may include:

- Earmarking municipal climate-resilient infrastructure funds
- Linking district-level planning to national budget allocations
- Introducing climate-responsive budgeting within MPWT and municipalities
- Leveraging community co-financing for small-scale drainage and green infrastructure
- Exploring microfinance or revolving funds for household-level resilient upgrades

1.2.5. Strengthening financing pathways: the next steps

In the following stage of implementation of SAP, an important focus should be made on the strengthening of financing pathways. This includes embedding priorities into public investment planning processes, improving project bankability, promoting blended finance approaches, strengthening domestic resource mobilization, and facilitating structured engagement with the private sector.

1.3. Leveraging existing initiatives and projects for implementation

To ensure effective implementation of the SAP-UrT, it is essential to build on and coordinate with existing and pipeline projects that share complementary objectives. Some ODA initiatives (presented in [Appendix 4](#)) represent significant ongoing investments by development partners in climate-resilient agriculture, sustainable forest management, watershed protection, and community-based livelihood programs.

Aligning SAP-UrT actions with these projects will help avoid duplication of efforts, leverage existing institutional and financial mechanisms, and create operational synergies for scaling up adaptation outcomes. Coordination with ODA-funded programs provides opportunities to integrate climate adaptation priorities into already funded interventions, ensuring continuity beyond the SAP's implementation period.

The SAP therefore encourages line ministries, provincial authorities, and development partners to establish structured coordination channels, through joint steering committees, shared monitoring frameworks, or harmonized work plans, to strengthen alignment between national adaptation priorities and donor-funded activities. This collaborative approach will maximize resource efficiency, enhance institutional learning, and accelerate the achievement of Lao PDR's climate-resilient development objectives.

2. Monitoring framework

A robust Monitoring, Evaluation and Learning (MEL) framework is essential to ensure effective implementation of the SAP-UrT, support evidence-based decision-making, and enable adaptive management over the 2026–2030 implementation period. Transparent reporting, monitoring and review are necessary to ensure adequate progress of the SAP- UrT and potentially propose corrective action if deemed necessary.

The SAP- UrT MEL framework is designed in alignment with the Lao PDR National Adaptation Plan (NAP) Monitoring, Evaluation and Learning system, which adopts a sectoral approach and establishes institutional coordination mechanisms led by the Ministry of Public Work and Transport (MPWT) in coordination with the Ministry of Agriculture and Environment (MAE). The SAP- UrT monitoring system therefore complements and operationalizes the national NAP MEL system within the Agriculture and Forestry sector.

Objectives of the SAP-AF MEL Framework

The MEL framework aims to:

- Monitor implementation progress of priority adaptation actions at national and provincial levels;
- Assess effectiveness and resilience outcomes in reducing climate risks identified in the CRVA;
- Ensure alignment with NAP objectives, NDC commitments and sectoral development plans;
- Track the integration of gender equality, disability and social inclusion (GEDSI) considerations;
- Support continuous learning and adaptive management across implementing institutions.

Institutional Arrangements and Coordination

In line with the NAP MEL system, the overall coordination of SAP- UrT monitoring will fall under MPWT (in coordination with the MAE and its Department of Environment) serving as the national focal point for adaptation reporting.

Within the Urban Development and Transport sector:

- The Department of Housing and Urban Planning (DHUP), Department of Roads (DoR), Department of Transport (DoT), Department of Water Supply (DWS), and the Department of Planning and Finance (DPF) will be responsible for sector-specific data collection, technical reporting, and monitoring of SAP-UrT implementation within their respective mandates;

- The Department of Planning and Finance (DPF) will consolidate sectoral data, track progress against SAP indicators, and ensure alignment with national planning, public investment programming, and budgeting systems;
- Provincial Departments of Public Works and Transport (DPWTs) will collect disaggregated implementation data using harmonized monitoring templates and sex-disaggregated indicators, and report progress to the central MPWT;
- Sectoral focal points within MPWT will coordinate with the Ministry of Agriculture and Environment (MAE), through the Department of Environment, to ensure integration of sectoral results into national NAP monitoring and reporting frameworks.

This structure ensures vertical integration (provincial–national) and horizontal coordination (across ministries), consistent with the national MEL institutional framework.

Measurement Approach and Indicator Structure

The SAP- UrT MEL indicators are presented with baselines and targets. Data should be collected through:

- Administrative reporting systems within MAE;
- Provincial implementation reports;
- Project-level M&E systems of externally financed adaptation programs;
- National statistics (where applicable);
- Periodic surveys and vulnerability assessments.

Annual progress reviews should be conducted in coordination with MAE and sectoral focal points. A mid-term review (2028) and final evaluation (2031) should assess effectiveness, efficiency, coherence, and sustainability of SAP-UrT implementation, consistent with national NAP review timelines.

Linkages to National and International Reporting

The monitoring framework integrates sector-specific indicators and aims to align them with the UNFCCC and NAP adaptation monitoring framework. Link with related NAP (listed in details [Appendix 5](#)) and UNFCCC indicators (listed in detail in [Appendix 6](#)) have been added in order for the SAP- UrT MEL framework to contribute to National NAP annual progress reporting and National Communications under the UNFCCC. By structuring sectoral data according to nationally harmonized formats, the SAP- UrT strengthens Lao PDR's capacity to provide robust adaptation evidence for the Global Stocktake and future GGA assessment processes.

Learning and Adaptive Management

Beyond compliance reporting, the SAP- UrT MEL framework emphasizes learning. Lessons learned, good practices, and implementation bottlenecks will be systematically documented and fed back into sectoral planning, budgeting cycles, and future revisions of the SAP and NAP.

Particular attention should be paid to:

- Effectiveness of climate-resilient agriculture technologies;
- Community-based forest management approaches;
- Gender-responsive adaptation interventions;
- Institutional coordination mechanisms.

The M&E framework presented in this SAP is proposed as a structured and practical foundation to guide implementation and reporting. It is intended to support clarity on indicators, responsibilities, and tracking mechanisms at this stage. However, final validation, refinement of baselines and targets, and confirmation of reporting arrangements should be led by the ministries responsible during detailed implementation planning. This will ensure that the framework remains realistic, aligned with sector capacities and national systems, and fully owned by the lead agencies, while retaining the flexibility needed to adapt over time.

Table 9: Monitoring Framework for the Urban Development and Transport Sectorial Plan

Objectives & actions		Responsibility	Indicators		Progress			GEDSI	
Adaptation actions	Activities	Department Responsible	Indicators	Data Collection Tools	Base-line	Mid-term review	End of program review	GEDSI indicator	GEDSI target (Mid-term and end of program review)
Strategic objective 1.1: Strengthen climate-proof urban planning and building standards									
1. Update and enforce building codes for climate resilience	Draft revisions	DHUP (Lead) -DPF, DOE (MAE) -	% of national building codes revised to integrate climate-resilient standards	Building code documents/ endorsement document	0%	50%	100%	% of female engineers / planners participating in revision consultations	At least 30% of women participants in revision consultation
	Develop and disseminate technical design manuals and model construction guidelines	DHUP (Lead) -DOE (MAE)-	No. of technical manuals developed and distributed to provinces	Workshop dissemination attendance sheets	0	2	5	% of design manuals and model guidelines that integrate inclusive and gender-responsive features	100% of design manuals and model guidelines that integrate inclusive and gender-responsive features
	Provincial training courses	DHUP (Lead) -DOE (MAE), DPWT, OPWT-	No. provincial training sessions held on climate-resilient building standards	Training attendance sheets	0	6	12	% of female trainees	At least 40% of provincial trained staff are women
	Set up inspection & compliance sections in Provincial Office for Public Work and Transport, enforcement pilots in 3 cities	DHUP (Lead) -DOE (MAE), OPWT -	No. of enforcements units established and operational	Inspection reports / Inspection reports	0	2	3	% of female officers appointed in SMEs trained on compliance with resilient construction standards	At least 30% women officers appointed in SMEs and trained on compliance with resilient construction standards
	Integrate climate-resilient design into vocational and university curriculum	DHUP (Lead)	No. of institutions integrating climate-	Approved module syllabus	0	3	8	% of modules integrating gender-sensitive component	100% of training includes gender sensitive modules.

		-DOE (MAE), DHE (MOES)-	resilient urban design modules						
Related NAP Indictors: 1.2 / 1.3									
Related UNFCCC Indictors: 9e07 / 10b01 / 10b03 / 10b04									
2. Develop and disseminate technical manuals for resilient infrastructure	Draft manuals	DHUP (Lead) -DOE (MAE)-	No of manuals drafted and validated by MPWT and relevant ministries	Final manual / Official endorsement letter	0	1	1	% of manuals including gender- responsive and universal accessibility standards	100% of the manual include gender sensitive and responsive standards.
	Conduct workshops in three targets districts	DHUP (Lead) -DOE (MAE)-	No. of workshop conducted	Workshop reports	0	2	6	% of women participants in workshops	At least 40% of female participants in the workshops.
	National rollout	DHUP (Lead) -DOE (MAE)-	No. of provinces adopting manuals for infrastructure projects	Official endorsement letters from provinces	0	6	18	% of women participants in national rollout workshops	At least 40% of female participants in the workshops.
Related NAP Indictors: 1.2 / 1.4 / 4.1 / 4.2									
Related UNFCCC Indictors: 9e07 / 10b01 / 10b03 / 10b04									
Strategic objective 1.2. Improve urban drainage and flood protection systems									
3. Collect and manage urban flood risk and drainage data	Assess existing drainage data and monitoring systems in 6 cities	DHUP (Lead) -DOE (MAE)-	No. of cities with drainage data assessments completed	Technical assessment reports	0	6	6	% of consultations involving women headed households	At least 40 % of consultation participants are women and ethnic groups
	Develop standardized data collection templates and tools	DHUP (Lead) -DOE (MAE)-	No. of standardized templates and tools framework developed and approved	Officially approved data templates	0	1	1	No. of data collection template including gender disaggregated and social vulnerability variables	At least 50% of the tools and 100% of the data collection template integrate of gender- sensitive and social differentiated data
	Establish a national GIS- based urban flood and drainage database	DHUP (Lead) -DOE (MAE)-	National GIS-based database established and operational	Functional GIS platform	0	Proto- type	Opera- tionnal	Degree of integration of social and gender- disaggregated data	Risk maps incorporate gender-disaggregated data and social vulnerability layers to identify priority

								on urban flood impact	risks for women headed and vulnerable households.
	Train provincial and municipal staff on data entry, use, and maintenance	DHUP (Lead) -DOE (MAE)-	No. of staff trained on GIS-based flood and drainage data management	Training attendance sheets	0	20	60	% of female participants in trainings	At least 40% of the municipal /provincial officers attending the trainings are women.
Related NAP Indictors: 2.4 / 2.5 / 2.6 / 2.7									
Related UNFCCC Indictors: 10a02 / 10c10 / 10c11									
4. Upgrade and expand stormwater drainage systems in priority cities	Conduct Hydrolysis studies and create drainage maps	DHUP (Lead) -DOE (MAE)-	No. of hydraulic and drainage maps completed and validated	Hydrological modeling reports	0	2	4	No. of pilot urban areas selected based on gender and social inclusion criteria	Existence of a documented gender and social inclusive methodology for risk mapping and pilot selection At least 2 pilot areas selected includes communities with high representation of vulnerable and/or female-headed households
	Conduct detailed studies in 4 test cities	DHUP (Lead) -DOE (MAE)-	No. of cities with updated drainage master plans and design packages	Feasibility study reports	0	1	3	% of women headed and vulnerable households' beneficiaries	At least 40 % of beneficiary households are women-headed households
	Construct or rehabilitate 20 km of main and secondary drainage canals	DHUP (Lead) -DOE (MAE)-	Length (km) of drainage canals rehabilitated or newly constructed	Construction supervision reports	0	10	20	% of laborers and site workers from local communities and vulnerable groups	At least 30% of construction workforce are local community members, with 20% women employed in non-manual roles
	Install silt traps and vegetative retention zones	DHUP (Lead) -DOE (MAE)-	No. of silt traps and vegetative retention zones installed	Construction supervision reports	0	10	25	No. of training sessions for community-based green infrastructure maintenance	At least 1 training session for community based green infrastructure organized per retention zones

	Develop maintenance guidelines and train municipal workers	DHUP (Lead) -DOE (MAE)-	No. of municipal workers trained on drainage maintenance	Training attendance sheets	0	50	150	% of female participants in trainings	At least 40% of the municipal officers attending the trainings are women.
Related NAP Indicators: 3.1 / 3.2 / 3.3 / 3.5 / 3.6 / 3.7 / 5.4									
Related UNFCCC Indicators: 9a03 / 9a06 / 10c03 / 10c10 / 10c11									
5. Conserve urban ponds, swamps, and wetlands for flood buffering	Conduct ecosystems surveys and create GIS maps to identify the location and areas of all lakes in Bulimati city	DHUP (Lead) -DOE (MAE)-	Comprehensive GIS inventory of urban ponds and wetlands	GIS inventory database	0	1	1	No. of pilot urban areas selected based on gender and social inclusion criteria	Existence of a documented gender and social inclusive methodology for pilot selection based on gender sensitive output.
	Designation of Legal Protected Zones in the Municipal Land Use Blueprint to prevent encroachment	DHUP (Lead) -DOE (MAE)-	No. of wetland zones officially designated as protected areas	Official zoning decrees	0	3	5	% of women headed households headed targeted by indirect benefits	FPIC is systematically collected and reported from local communities in each site At least 40 % of programs beneficiary are women-headed households
	Implement pilot restoration projects with native vegetation buffers in wetland zone and create green parks	DHUP (Lead) -DOE (MAE)-	No. of hectares restored with native vegetation buffers	Project Progress Reports	0	10	50	% of pilot restoration project that are community led	At least 50% of the pilot project are community led and co-managed.
	Establish & train inclusive co-management committees	DHUP (Lead) -DOE (MAE)-	No. of co-management committees established and operational	Committees' membership lists/Training attendance sheets	0	2	10	% of committee members who are women or ethnic minority representatives	At least 40% of co-management committee members are women At least 30% of leadership positions held by women.
	Develop and mobilize sustainable finance plan	DHUP (Lead) -DOE (MAE)-	No. of cities with a sustainable finance plan for wetland management	Endorsed finance plan document	0	1	5	% of financing plan including gender-responsive budgeting	100% of finance plan for wetland management include gender responsive budgeting.
Related NAP Indicators: 3.1 / 3.2 / 3.5 / 3.6 / 5.4									
Related UNFCCC Indicators: 9d01 / 9d02 / 9d04 / 9d05 / 10c03 / 10c10 / 10c11									
Strategic objective 2.1: Promote low-carbon and resilient public transport systems									

6. Invest in electric buses, trains, and renewable-powered public transport	CRVA dedicated to transport systems	DOT (Lead) -DOE (MAE)-	No. of CRVA dedicated to transport systems conducted	CRVA report / Validation workshop report	0	1	1	Degree of integration of social and gender differentiated vulnerability	CRVA incorporate gender-disaggregated data and social vulnerability narrative to identify priority risks for women headed and vulnerable households.
	Develop adaptation plans for critical transport infrastructure	DOT (Lead) -DOE (MAE)-	No. adaptation plans developed for key transport assets (roads, bridges, terminals)	Endorsed adaptation plans / workshop report	0	3	6	% of transport plans integrating gender-responsive mobility considerations	100% of transport plans integrate gender-responsive mobility considerations
	Feasibility studies for e-mobility integration in 3 pilot cities	DOT (Lead) -DOE (MAE)-	No. of feasibility studies on e-mobility completed and validated	Approved adaptation plans	0	2	3	% of studies assessing impacts on women's mobility and accessibility	100% of feasibility studies integrate assessment on the impacts on women's mobility and accessibility
	Deploy pilot electric bus fleets and charging stations in pilot cities	DOT (Lead) -DOE (MAE)-	No. of e-bus fleets deployed and operational;	Project progress report / Procurement document	0	10	30	% of female drivers, operators, and maintenance trainees employed	At least 30% of trained drivers and operator are women
	Train drivers, maintenance staff and operators	DOT (Lead) -DOE (MAE)-	No. of staff trained in electric vehicle operation and maintenance	Training attendance sheets	0	50	120	% of women among trainees	At least 30% of trained operators are women
Related NAP Indicators: 6.1 / 6.2									
Related UNFCCC Indicators: 10a02 / 10b10 / 10c10 / 10c11									
7. Reduce transport-related pollution and GHG emissions	Conduct baseline air-quality and GHG emission inventory in 6 urban centers	DOT (Lead) -DOE (MAE)-	No. of baseline inventories completed and publicly shared	Published inventories	0	3	6	% of survey and data-collection teams including female technicians	At least 40% of survey and data-collection team include female technicians
	Develop and adopt national emission standards for vehicles and fuels	DOT (Lead) -DOE (MAE)-	National emission standards drafted, approved, and enforced	Government Gazette publication records	None	Drafted	Adopted and enforced	% of participants in consultation workshops on emission standards	At least 40% of participants in consultation workshops on emission standards are women or

								who are women or represent vulnerable groups	represent vulnerable groups
	Establish permanent air-quality monitoring stations in 3 pilot urban centers	DOT (Lead) -DOE (MAE)-	No. of operational monitoring stations	Station installation reports / Monitoring database	0	2	3	% of monitoring staff trained are women	At least 30% of trained monitoring staff are women
	Promote modal shift campaigns (cycling, walking, car-free zones)	DOT (Lead) -DOE (MAE)-	No. awareness campaigns and car-free events organized annually	Campaign completion report	0	5	10	% of awareness campaigns co-designed with LWUs, LYUs and/or disability associations	100% of the awareness campaign have been co-designed and developed with the support of LWUs and LYUs and disability association and 100% of training includes gender sensitive modules and are available in ethnic languages with inclusive formats for illiterate persons.

Related NAP Indictors: 6.1 / 6.2

Related UNFCCC Indictors: 10a02 / 10b02 / 10b06 / 10c10 / 10c11

Strategic objective 2.2: Strengthen transport resilience through planning and innovation

8. Assess climate impacts on transport systems	Conduct vulnerability assessments for major transport corridors and urban mobility networks	DOR /DOT (Lead) -DOE (MAE)-	No. of vulnerability assessments completed and validated	CRVA reports	0	3	6	Degree of integration of social and gender differentiated vulnerability	Vulnerability assessment incorporate gender-disaggregated data and social vulnerability narrative to identify priority risks for women headed and vulnerable households.
	Develop GIS-based database for asset exposure and sensitivity	DOR /DOT (Lead) -DOE (MAE)-	GIS database established integrating climate hazard and asset data	GIS platform	No data-base	Proto-type functional	Fully operational and accessible	% of female provincial technical officers trained in	At least 30% of provincial technical officers trained in data collection and

								data collection and database updating	database updating are women
	Develop engineering design standards manuals	DOR /DOT (Lead) -DOE (MAE)-	Climate-resilient design standards manual for transport infrastructure completed	Validation workshop report / Official approval records	0	Draft completed	Final version validated and distributed to all provinces	No. of gender- and inclusion-sensitive design principles integrated	At least 6 design principles should be gender and inclusion sensitive

Related NAP Indictors: 2.1 / 2.3

Related UNFCCC Indictors: 10a02 / 10b02 / 10b04

9. Prepare adaptation plans for critical transport infrastructure	Identify priority roads, bridges, and urban corridors at high risk	DOR /DOT (Lead) -DOE (MAE)-	No. of critical transport assets identified and mapped	Asset mapping database	0	50 assets	150 assets across 10 provinces	% of prioritized sites selected based on gender and social inclusion criteria	100% of prioritized sites demonstrate direct risks for women and vulnerable households
	Prepare costed adaptation plans and monitoring indicators	DOR /DOT (Lead) -DOE (MAE)-	No. of costed adaptation plans developed and submitted	Adaptation plan documents	0	3	6	% of adaptation plans including gender-responsive and community benefit indicators	100% of adaptation plans including gender-responsive and community benefit indicators
	Prepare a transportation masterplan	DOR /DOT (Lead) -DOE (MAE)-	No. of transportation master plan approved	Endorsed transportation master plan	None	Draft finalized	Validated	Integration of gender and social inclusion considerations in transport masterplan	% of masterplan chapters incorporating gender-responsive mobility and accessibility analysis
	Develop and Investment Mobilization and Financing Strategy for Climate Resilient Transport Infrastructure	DOR /DOT (Lead) -DOE (MAE)-	No. of climate-resilient transport projects included in the financing pipeline	Project appraisal sheets	0	3	5	% of prioritized investment projects including gender-responsive budgeting and social inclusion criteria	100% of prioritized investment projects including gender-responsive budgeting and social inclusion criteria

Related NAP Indictors: 1.5 / 1.7

Related UNFCCC Indictors: 10a02 / 10b01 / 10b02

Strategic objective 3.1. Conserve and restore urban ecosystems and natural buffers

10. Designate and protect high-risk urban areas (no-build zones)	Map flood- and landslide-prone zones in major cities	DHUP (Lead) -DOE (MAE)-	No. Cities with hazard and risk maps produced and validated	GIS hazard maps	0	3	6	Degree of integration of social and gender differentiated vulnerability	Map risk assessment incorporating social and gender-disaggregated data to identify priority risks for women headed and vulnerable households.
	Draft and adopt urban zoning by-laws restricting new construction in 6 cities	DHUP (Lead) -DOE (MAE)-	No. of cities adopting zoning by-laws restricting new development in high-risk zones	Official zoning decrees	0	3	6	% of affected households (by zoning restrictions) receiving inclusive information and consultation in local languages	FPIC is systematically collected and reported from local communities in each site and 100 % of affected households consulted and compensated fairly
Related NAP Indictors: 3.4									
Related UNFCCC Indictors: 10a02 / 10b02 / 10b05									
11. Restore and manage wetlands, ponds, and riversides	Identify 5 priority urban areas for pilot programs	DHUP (Lead) -DOE (MAE)-	No. urban areas selected	Official approval documenta-tion	0	5	5	Degree of integration of social and gender differentiated vulnerability	Map risk assessment incorporates social and gender-disaggregated data to identify priority risks for women headed and vulnerable households.
	Conduct ecosystem inventory and classify wetlands by ecological function	DHUP (Lead) -DOE (MAE)-	No. of cities adopting zoning by-laws restricting new development in high-risk zones	Official zoning decrees	0	3	6	% of affected households (by zoning restrictions) receiving inclusive information and consultation in local languages	FPIC is systematically collected and reported from local communities in each site and 100 % of affected households consulted and compensated fairly
	Design and implement 2 restoration pilots' program per urban areas (native vegetation, riparian buffers).	DHUP (Lead) -DOE (MAE)-	No. of priority urban areas identified and validated for wetland restoration	Project progress reports	0	3	5	No. of prioritized urban areas selected based on gender and social inclusion criteria	Existence of a documented gender and social inclusive methodology for risk mapping and pilot selection At least 3 of 5 pilot areas selected includes

									communities with high representation of vulnerable and/or female-headed households
	Develop management plans with local authorities and communities.	DHUP (Lead) -DOE (MAE)-	Wetland inventory and classification report completed and validated by MAE	Validation workshop reports / Official endorsement records	0	Completed in 3 cities	Validated national inventory covering 5 cities	% of enumerators and technical staff who are women	At least 40% of enumerator and technical staff are women.
	Promote eco-tourism and livelihood diversification around restored sites.	DHUP (Lead) -DOE (MAE)-	No. of restoration projects implemented	Project progress reports	0	5	10	Involvement of local communities and women.	FPIC is systematically collected and reported from local communities in each site At least 40 % of programs beneficiary are women-headed households and at least 40% of women among community members participating in site restoration activity
Related NAP Indicators: 3.2 / 3.6 / 3.7 / 5.4									
Related UNFCCC Indicators: 9d01 / 9d02 / 9d04 / 9d05 / 10c10 / 10c11									
Strategic objective 3.2 Strengthen sustainable waste management systems									
12. Improve and build model landfills in cities	Identify 3 cities for pilot programs	DHUP (Lead) -DOE (MAE)-	No. of cities selected for pilot landfill programs	Official approval documentation	0	3	3	No. of prioritized urban areas selected based on gender and social inclusion criteria	Existence of a documented gender and social inclusive methodology for pilot selection with targeted benefits for women headed and vulnerable households.
	Assess existing landfill conditions and identify priority rehabilitation sites	DHUP (Lead) -DOE (MAE)-	No. of landfill assessments and rehabilitation plans completed	Engineering assessment reports / E&S safeguard	0	2	3	% of assessment teams including female engineers and technicians	At least 40% women engineers / technicians in assessment team

				screening forms					
	Design model sanitary landfills	DHUP (Lead) -DOE (MAE)-	No. of engineering designs meeting climate-resilient standards	Design approval documentation	0	2	3	% of landfill designs incorporating gender-sensitive safety, sanitation, and working-area provisions	100% of landfill designs incorporating gender-sensitive safety, sanitation, and working-area provisions
	Construction works	DHUP (Lead) -DOE (MAE)-	No. of landfills constructed or rehabilitated to model standard	Construction progress reports	0	1	3	% of laborers and site workers from local communities and vulnerable groups	At least 30% of construction workforce are local community members, with 20% women employed in non-manual roles
	Train municipal staff on waste segregation and recycling systems	DHUP (Lead) -DOE (MAE)-	No. of staff trained (technical + GEDSI modules)	Training attendance sheets	0	40	100	% of women among trained staff	At least 40% of trained staff are women.

Related NAP Indictors: 3.3 / 3.8 / 4.5

Related UNFCCC Indictors: 9a06 / 9a10 / 10c10 / 10c11

13. Integrate climate-smart standards for urban environmental management	Review and revise existing regulations on waste, drainage, and green infrastructure to include climate-resilient standards	DHUP (Lead) -DOE (MAE)-	No. of urban regulations revised to include climate criteria	Official draft and final regulation documents / Official endorsement documentation	0	Draft finalized	Regulation Validated	% of reviewed regulatory documents integrating gender- and social-inclusion clauses (e.g., equitable access to services, community consultation requirements)	100% of reviewed regulatory documents integrating gender- and social-inclusion clauses
	Develop and disseminate updated permitting guidelines incorporating ecosystem-service valuation	DHUP (Lead) -DOE (MAE)-	No. of guidelines issued and distributed nationally	Distribution records to provinces / Dissemination	0	Draft approved	Guideline disseminated	% of training sessions with gender-responsive content	100% of training includes gender sensitive and responsive modules.

				workshop reports					
	Train municipal staff, engineers, and developers on enforcement and compliance monitoring	DHUP (Lead) -DOE (MAE)-	No. of personnel trained in compliance and enforcement	Training attendance sheets	0	60	150	% of women among trained staff and developers	At least 40% of trained staff are women.
Related NAP Indicators: 1.2 / 3.3									
Related UNFCCC Indicators: 10b02 / 10c10 / 10c11									
14. Raise community awareness on ecosystem protection	Co-design awareness campaign materials and inclusive formats	DHUP (Lead) -DOE (MAE)-	No. of communication kits developed in Lao and ethnic languages	Communication materials archive	0	5	10	% of materials co-created with LWUs and LYUs	At least 40% of the communication kits have been co-developed with the support of LWUs and LYUs and 100% of training includes gender sensitive modules and are available in ethnic languages with inclusive formats for illiterate persons.
	Integrate ecosystem protection and waste reduction modules into formal school curricula and official youth union activity plans	DHUP (Lead) -DOE (MAE), DTE and DGE (MOES)-	No. of teachers trained on delivering ecosystem protection and waste reduction modules	MOES training reports including attendance sheets	0	500	1000	% of female teachers among teacher trained as focal points for delivering ecosystem protection and waste reduction modules	At least 50% of female teachers among teacher trained as focal points for delivering ecosystem protection and waste reduction modules
	Roll out targeted campaigns in schools, markets, and neighborhoods in wetland-proximate urban areas	DHUP (Lead) -DOE (MAE)-	No. local campaigns conducted in wetland-proximate cities	Campaign activity reports	0	50	100	No. of women and youth reached	At least 1,000 women and 1,000 youth under 21 years old have been reached by the campaigns.

	Establish and manage seed funding and mentorship program for community-led micro-projects	DHUP (Lead) -DOE (MAE)-	No. of community micro-projects funded and mentored	Project Progress Report	0	5	15	% of projects community led with women in leadership position	At least 50% of the projects are community led with women in leadership position
	Implement feedback mechanisms and report annually on participation data and impact	DHUP (Lead) -DOE (MAE)-	No. of annual participation and impact reports produced	Annual monitoring reports	0	2	5	% of respondents in feedback surveys who are women	At least 50% of respondents in feedback surveys are women
Related NAP Indicators: N/A									
Related UNFCCC Indicators: 9d01 / 10c10 / 10c11									
15. Mobilize municipal investment for urban ecosystem protection	Pipeline developed	DPF (Lead) - DHUP, DOE (MAE)-	No. of bankable projects prepared for financing	Project concept notes	0	5	10	% of projects incorporating gender-responsive benefits	100% of the project incorporate gender-responsive benefits
	Support integration of urban ecosystem financing into city master plans	DPF (Lead) - DHUP, DOE (MAE)-	No. of cities with urban ecosystem financing integrated into the city masterplan	Updated masterplan documents	0	3	5	No. of updated city masterplans integrating allocations benefiting women and vulnerable groups	All city masterplans updated integrate allocations benefiting women and vulnerable groups
	Pilot co-financing models with private sector and community groups in 5 cities	DPF (Lead) - DHUP, DOE (MAE)-	No. of PPP and community co-financing agreements signed	Signed MoUs / PPP agreements	0	3	5	% of co-financing initiatives that include women's or community-based organizations as implementing partners	At least 50% of co-financing initiatives that include women's or community-based organizations as implementing partners
Related NAP Indicators: 3.2 / 3.8									
Related UNFCCC Indicators: 10b04 / 10b06 / 10b07									

Appendix

[Appendix 01](#): CRVA indicators and thresholds presentation

[Appendix 02](#): Multi-Criteria Analysis Matrix for the Urban Development and Transport Sector

[Appendix 03](#): Ranked Adaptation Action during Sectoral Consultation

[Appendix 04](#): List of ODA- Climate-related Projects planned and ongoing in the Urban Development and Transport Sector

[Appendix 05](#): List and description of M&E related NAP indicators

[Appendix 06](#): List and description of M&E related UNFCCC indicators

Appendix 07: SAP Workshop Report

Appendix 01: CRVA indicators and thresholds presentation

Table 10: Identified indicators and derived variables

Sectors	Sub-categories	Indicators	Definition	Variable
Agriculture & Forestry	Agriculture yields	Heat Stress Index	Annual number of days when HeatIndex exceeds a critical threshold the crop during the growing season	HeatIndex (derived from maximum daily temperature and mean daily relative humidity)
		Drought Stress Index	Annual maximum number of consecutive dry days (precipitation < 1mm)	Daily precipitation
	Livestock	Heat Stress Index	Annual number of days THI exceeds critical limits for animal	Temperature Humidity Index (derived from max daily t° and mean daily relative humidity)
	Fish stock	Heat Stress Index	Annual number of days with Tmax > 30°C (proxy for hot water)	Maximum daily temperature
	Soil Quality	Soil Quality Index	Annual number of days with climatic water deficit (PET – Precipitation > 0)	Potential Evapotranspiration (derived from max daily t°) and daily precipitation
	Forest & Biodiversity	Heat Stress	Events/Years where Tmax > threshold for ≥ 3 consecutive days	Maximum daily temperature
Water resources management	Water Quality	Heat stress index	Annual max temperature	Maximum daily temperature
	River & Reservoir flows	Flood stress Index	Maximum 5-day cumulated precipitation	Daily precipitation
	Groundwater management	Precipitation groundwater index	Cumulated precipitation	Daily precipitation
Urban Development & Transport	Infrastructures Urban ecosystems Urban clean up Water infrastructure Hydraulic infra	Flood stress Index	Maximum 5-day cumulated precipitation	Daily precipitation
		Run off stress Index	Maximum daily precipitation	Daily precipitation
		Urban clean up stress	Number of days with precipitation >25mm	Daily precipitation
		Night heat stress	Number of nights with Tmin > 25°C	Minimum daily temperature

Table 11: Indicators context specific daily thresholds

		Daily threshold	Low	Moderate	High	Very high
Heat Stress Index for agriculture crops	Annual number of days when HeatIndex exceeds a critical threshold the crop during the growing season	HI > 36°C	< 5 days	5-10 days	10-20 days	>20 days
Drought Stress Index	Annual maximum number of consecutive dry days (precipitation < 1mm)	Precipitation <1mm	< 7 days	7-14 days	14-21 days	>21 days
Heat Stress Index for Livestock	Annual number of days THI exceeds critical limits for animal	THI >28°C	<10 days	10-20 days	20-30 days	>30 days
Heat Stress for fish stock	Annual number of days with Tmax >30°C (proxy for hot water)	Max T° >32°C	<10 days	10-20 days	20-30 days	>30 days
Soil Quality Index	Annual number of days with climatic water deficit (PET – Precipitation >0)	CWD > 0	<20%	20-30%	30-40%	>40%
Heat Stress Index (forest biodiversity)	Events/Years where Tmax > threshold for ≥ 3 consecutive days	Max T° > 35°C	0-1 events	2-3 events	4-5 events	>5 events
Run off stress Index	Maximum daily precipitation		<25mm	25-50mm	50-75mm	>75 mm
River Flooding stress Index	Maximum 5-day cumulated precipitation		<100mm	100-150 mm	150-200 mm	>200mm
Precipitation groundwater index	Cumulated precipitation		>1500mm	1250-1500 mm	1000-1250mm	<1000mm
Heat Stress Index (Water quality)	Annual max temperature		<35°C	35-40°C	40-45°C	>45°C
Urban clean up stress	Number of days with precipitation >25mm		<2days	2-5days	5-10 days	>10 days
Night heat stress	Number of nights with Tmin > 25°C	Min T°>25°C	<5 nights	5-10 nights	10-20 nights	>20 nights

Appendix 02: Multi-Criteria Analysis Matrix for the Urban Development & Transport Sector

Evaluation criteria:				Severity of CC Impacts			Poverty Reduction			High Value			Alignment with Environmental & Climate			Lives & Livelihood security			Feasibility of Implementation & availability of resources			Sustainability & long term benefits			Institutional capacity to implement			Financial operationalization			Urgency of Action			TOTAL
Proposed adaption measures from NAP-UNEP				Score	Weighting	Weighted score	Score	Weighting	Weighted score	Score	Weighting	Weighted score	Score	Weighting	Weighted score	Score	Weighting	Weighted score	Score	Weighting	Weighted score	Score	Weighting	Weighted score	Score	Weighting	Weighted score	Score	Weighting	Weighted score	Score	Weighting	Weighted score	
1	Create building management regulations (Building Code) and improve waste management regulations			8	0,4	3,2	6	0,6	3,6	6	0,7	4,2	8	0,8	6,4	9	0,8	7,2	9	1	9	9	1	9	9	0,6	5,4	6	1	6	8	0,4	3,2	57,2
2	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.			8	0,4	3,2	3	0,6	1,8	3	0,7	2,1	6	0,8	4,8	8	0,8	6,4	8	1	8	8	1	8	8	0,6	4,8	10	1	10	8	0,4	3,2	52,3
3	Improve and build drainage systems and flood prevention in various cities, along with the protection of ponds, swamps, riverside areas and wetlands to ensure that cities have a healthy ecosystem and are resistant to climate change.			8	0,4	3,2	3	0,6	1,8	3	0,7	2,1	6	0,8	4,8	8	0,8	6,4	8	1	8	8	1	8	8	0,6	4,8	10	1	10	8	0,4	3,2	52,3
4	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			8	0,4	3,2	2	0,6	1,2	2	0,7	1,4	9	0,8	7,2	9	0,8	7,2	8	1	8	8	1	8	8	0,6	4,8	8	1	8	8	0,4	3,2	52,2
5	Improve and build model landfills in small towns, second-ranked towns and big towns.			7	0,4	2,8	5	0,6	3	5	0,7	3,5	7	0,8	5,6	7	0,8	5,6	8	1	8	8	1	8	8	0,6	4,8	8	1	8	7	0,4	2,8	52,1
6	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.			5	0,4	2	5	0,6	3	6	0,7	4,2	8	0,8	6,4	6	0,8	4,8	8	1	8	8	1	8	8	0,6	4,8	8	1	8	6	0,4	2,4	51,6
7	Develop manuals on technical standards for managing the construction and repair of public works and transport infrastructure to cope with climate change.			7	0,4	2,8	4	0,6	2,4	4	0,7	2,8	8	0,8	6,4	6	0,8	4,8	9	1	9	8	1	8	8	0,6	4,8	6	1	6	9	0,4	3,6	50,6
8	Assess the impact of climate change on the sector of public infrastructure and transportation, as well as build organizational and			7	0,4	2,8	4	0,6	2,4	4	0,7	2,8	8	0,8	6,4	6	0,8	4,8	9	1	9	8	1	8	8	0,6	4,8	5	1	5	9	0,4	3,6	49,6
9	Study and collect data on drainage ditches within the city that are prone to floods during the rainy season in areas across the country.			8	0,4	3,2	5	0,6	3	5	0,7	3,5	8	0,8	6,4	8	0,8	6,4	8	1	8	8	1	8	3	0,6	1,8	6	1	6	8	0,4	3,2	49,5
10	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.			7	0,4	2,8	4	0,6	2,4	4	0,7	2,8	8	0,8	6,4	6	0,8	4,8	9	1	9	8	1	8	8	0,6	4,8	2	1	2	9	0,4	3,6	46,6
11	Develop and implement regulations, standards and plans for adaptation and investment in the field of public infrastructure and			7	0,4	2,8	4	0,6	2,4	4	0,7	2,8	8	0,8	6,4	6	0,8	4,8	9	1	9	8	1	8	8	0,6	4,8	2	1	2	9	0,4	3,6	46,6
12	Study the possibility of conserving ponds, swamps, waterside areas and wetlands that is seen as necessary to maintain the ecological system of the city.			9	0,4	3,6	5	0,6	3	5	0,7	3,5	10	0,8	8	8	0,8	6,4	3	1	3	9	1	9	3	0,6	1,8	5	1	5	8	0,4	3,2	46,5
13	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			5	0,4	2	5	0,6	3	5	0,7	3,5	10	0,8	8	8	0,8	6,4	7	1	7	7	1	7	7	0,6	4,2	1	1	1	8	0,4	3,2	45,3
14	Develop urban drainage planning and management standards for maintaining the environment in the construction and renovation			8	0,4	3,2	3	0,6	1,8	3	0,7	2,1	6	0,8	4,8	8	0,8	6,4	8	1	8	8	1	8	8	0,6	4,8	3	1	3	8	0,4	3,2	45,3
15	Encourage and promote the implementation of the Urban Environment Improvement Investment Projects in the			5	0,4	2	5	0,6	3	5	0,7	3,5	6	0,8	4,8	7	0,8	5,6	9	1	9	8	1	8	9	0,6	5,4	1	1	1	7	0,4	2,8	45,1

Appendix 03: Ranked Adaptation Actions during Sectoral Consultation

Table 12: Summaries of Scores and Ranked adaptation Actions by department

Actions	Economic feasibility (from 1 – 3)			Institutional feasibility (from 1-3)			Prioritization (cross 5 actions to prioritize)		
	DWS	DOW	Total	DWS	DOW	Total	DWS	DOW	Total
1. Update and enforce building codes for climate resilience	2	0	2	2	0	2	2	1	2
2. Develop and disseminate technical manuals for resilient infrastructure	3	0	3	3	0	3	1	0	1
3. Upgrade and expand stormwater drainage systems in priority cities	0	0	0	0	0	0	0	0	0
4. Conserve urban ponds, swamps, and wetlands for flood buffering	2	0	2	2	0	2	4	4	4
5. Collect and manage urban flood risk and drainage data	3	0	3	3	0	3	3	0	2
6. Invest in electric buses, trains, and renewable-powered public transport	0	0	0	0	0	0	0	2	1
7. Reduce transport-related pollution and GHG emissions	0	0	0	0	0	0	0	0	0
8. Assess climate impacts on transport systems	0	0	0	0	0	0	0	0	0
9. Prepare adaptation plans for critical transport infrastructure	0	0	0	0	0	0	0	0	0
10. Designate and protect high-risk urban areas (no-build zones)	0	0	0	0	0	0	0	0	0
11. Restore and manage wetlands, ponds, and riversides	2	0	2	2	0	2	4	3	4
12. Improve and build model landfills in cities	0	0	0	0	0	0	0	0	0
13. Integrate climate-smart standards for urban environmental management	0	0	0	0	0	0	0	0	0
14. Raise community awareness on ecosystem protection	3	0	3	3	0	3	5	0	3
15. Mobilize municipal investment for urban ecosystem protection	0	0	0	0	0	0	0	5	3

Source: SAP-FGD with Urban Development and Transport Sector, dated 2 October 2025.

Appendix 04: List of ODA- Climate-related Projects planned and ongoing in the Urban Development and Transport Sector

Table 13: Climate-Related Projects Identified in MPWT ODA and Plan for 2026

#	Project Title	Department	Project Period	Total Budget (USD)	Location	Budget Breakdown
1	Flood Risk Management in Lao PDR	Department of Waterway (DOW)	2020–2026	73,209,071	Luang Prabang city (Luang Prabang province), Pakxan district (Bolikhamxay province), Xay district (Oudomxay province)	WB grant: 73.2M; GOL: 0
2	Drainage & Riverbank Protection	Department of Water Supply (DOW)	2020–2026	87,234,451	Luang Prabang	WB grant: 87.2M; GOL: 0
3	Water Supply & Sanitation (4 Northern Provinces)	DWS	2020–2026	249,068,000	Northern Laos	WB loan: 166.9M; GOL: 72.4M; Grant: 9.3M
4	Water Supply & Sanitation (ADB Grant 0604-LA)	DWS	2020–2026	244,864,000	Nationwide	ADB grant: 228.2M; GOL: 16.7M
5	Water Transmission System – Luang Prabang	DOW	2020–2025	159,526,000	Luang Prabang Capital	JICA grant: 144.6M; GOL: 15M
6	Climate-Resilient Rural Connectivity (CRRCIP)	DOR	2025 onward	1,161,336,000	Nationwide	WB/ADB/AIIB loan: TBD; GOL: TBD

7	Water Information Management System	DWS	2025 onward	87,214,250	National	Donor: TBD; GOL: TBD
8	Wastewater & Sludge Treatment Capacity	DOR	2020–2024	59,921,640	Urban centers	KOICA/GGGI grant: 59.9M; GOL: 0
9	Urban Development – GMS Corridor 2	Department of Housing and Urban Planning (DHUP)	2017–2027	416,000,000	Huayxai, Luang Namtha	ADB loan: 416M; GOL: TBD
10	Urban Development – GMS Corridor 4	DHUP	2019–2023	59,921,640	Northern corridor towns	ADB grant: 59.9M; GOL: 0
11	Rural Development Programme II	DOR	2020–2026	64,005,680	Khammouane Province	KfW grant: 64M; GOL: 0
12	Rural Development Programme III	DOR	2023–2027	90,004,050	Houaphanh Province	KfW grant: 90M; GOL: 0
13	Rural Development Programme IV	DOR	2024–2027	61,323,650	Phongsaly Province	KfW grant: 61.3M; GOL: 0
14	SEARECC – Climate Resilient Roads	DOR	2024–2028	283,863,866	Phongsaly, Luang Namtha, Oudomxay, Xayabouly, Houaphanh	WB/EIB/AIIB loan: 283.9M; GOL: TBD
15	Environmental Risk & Waste Control	DHUP	2024–2029	495,030,070	National	Donor: TBD; GOL: TBD

Source: MPWT ODA data. Updated 09 July 2025

Appendix 05: List and description of M&E related NAP indicators

ID	Indicators
STRATEGY 1: MAINSTREAM CLIMATE ADAPTATION INTO POLICY, PLANNING AND REGULATORY FRAMEWORKS	
<i>Institutional & Policy Indicators</i>	
1.1	Ministry 5-year development plan integrated with adaptation
1.2	At least 1 regulation/standard related to adaptation and investment developed or improved
1.3	At least 1 building code developed or revised
1.4	At least 1 national disaster response manual developed or updated
1.5	At least 1 Climate Resilience Management Plan developed
1.6	At least 1 system to monitor and report adaptation implementation developed
1.7	At least 1 capacity development plan approved
STRATEGY 2: STRENGTHEN CLIMATE RISK ASSESSMENT, DATA SYSTEMS AND KNOWLEDGE BASE	
<i>Risk & Data Indicators</i>	
2.1	At least 1 CRVA for public works and transport conducted
2.2	At least 1 CRVA for rural development and human settlements conducted
2.3	At least 2 research studies on adaptation technologies completed
2.4	At least 4 urban resilience studies (e.g., City Resilience Index)
2.5	At least 1 disaster database developed
2.6	At least 1 integrated urban development information system developed
2.7	At least 1 digital GIS-based urban database developed
STRATEGY 3: ENHANCE URBAN INFRASTRUCTURE RESILIENCE AND SMART/GREEN CITY DEVELOPMENT	
<i>Urban Infrastructure Indicators</i>	
3.1	At least 5 pilot urban drainage/flood prevention projects implemented
3.2	At least 4 cities adopt green/resilient city approaches
3.3	At least 5 urban infrastructure standards updated to include climate-adaptive design
3.4	At least 3 land reallocation projects in overcrowded/high-risk areas
3.5	At least 45 districts improve management of disaster-vulnerable urban areas
3.6	At least 3 EbA/NbS urban projects implemented annually

ID	Indicators
3.7	At least 10 public works projects integrate adaptation and resilience
STRATEGY 4: STRENGTHEN CLIMATE-RESILIENT TRANSPORT SYSTEMS	
<i>Transport Infrastructure Indicators</i>	
4.1	At least 1 technical standard for climate-resilient road construction developed
4.2	At least 2 manuals updated for highway construction and maintenance
4.3	Number of roads maintained/repared (km)
4.4	Mechanism for post-disaster reconstruction improved
4.5	At least 5 training sessions per year on maintenance & climate risk
STRATEGY 5: STRENGTHEN DISASTER PREPAREDNESS AND EARLY WARNING IN URBAN AREAS	
<i>Preparedness Indicators</i>	
5.1	Number of disaster preparedness and response plans developed
5.2	Number of coordination workshops organized annually
5.3	Number of early warning systems developed
5.4	Drainage/flood defense systems improved (number or percentage)
STRATEGY 6: PROMOTE LOW-CARBON AND CLIMATE-RESILIENT URBAN MOBILITY	
<i>Sustainable Mobility Indicators</i>	
6.1	Number of electric bus projects increased
6.2	Percentage of environmentally friendly vehicles increased

Source: Lao People's Democratic Republic. (2025). *National Adaptation Plan of the Lao PDR* [PDF]. Ministry of Agriculture and Environment (MAE). Retrieved from: <https://naplaos.com/nap>

Appendix 06: List and description of M&E related UNFCC indicators

ID	Indicator Name	Description
9(a) Significantly reducing climate-induced water scarcity and enhancing climate resilience to water-related hazards towards a climate-resilient water supply, climate-resilient sanitation and access to safe and affordable potable water for all		
9a03	Proportion of critical water and sanitation infrastructure systems that are built or retrofitted to withstand climate-related hazards	This indicator measures proportion of critical water and sanitation infrastructure systems that are built or retrofitted to conform with national regulations and standards for climate resilience. Critical water infrastructure refers to essential water-related systems and facilities that have the ability to prevent, protect against, or recover from disasters. This ensures that services essential for the maintenance of vital societal functions, economic activities, public health and safety, or the environment (essential services) are constantly available. Critical water related infrastructure could include among others (and it is not limited to) drinking water suppliers and distributor networks, reservoirs, dams, wastewater collection and treatment plants, electricity production like hydropower, transport on water and flood protection systems, irrigation systems and supporting assets like pumps and control centers. Water and sanitation infrastructure may be considered critical for health, education, agriculture, industry or other purposes. Data on the number and proportion of critical water and sanitation infrastructure systems that are designed, built or retrofitted to withstand climate-related hazards is typically available from National Adaptation Plans, or equivalent policy instruments, and from relevant national line ministries and institutions (e.g. for Water, Agriculture and Environment).
9a06	Proportion of population using sanitation services that are safely managed and climate resilient	This indicator builds on the established SDG indicator 6.2.1a which tracks the proportion of the population using safely managed sanitation services (an improved sanitation facility that is not shared with other households and where excreta are safely disposed of in situ or removed and treated off-site) and integrates additional information on climate resilience. A standardized definition and methodology for assessing "climate resilient" sanitation services is currently being developed by the WHO/UNICEF JMP which is responsible for global monitoring of drinking water, sanitation and hygiene.
9a10	Number of Parties that integrate climate adaptation measures in their national plans for water resources management and water supply and sanitation plans	This indicator assesses the extent to which national plans for water resources management and water supply and sanitation integrate climate adaptation measures. It builds on established process indicators with existing guidance and system of reporting on progress towards SDG targets. SDG 6.5.1 country survey assesses the degree of integrated water resources management implementation at national level (0-100) and could be expanded to include implementation of climate adaptation measures. The UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) survey assesses the extent to national water,

ID	Indicator Name	Description
		sanitation and hygiene (WASH) plans include climate risk assessment. Adaptation measures are country specific but there are established methods for assessing degrees of implementation.
9(d) Reducing climate impacts on ecosystems and biodiversity, and accelerating the use of ecosystem-based adaptation and nature-based solutions, including through their management, enhancement, restoration and conservation and the protection of terrestrial, inland water, mountain, marine and coastal ecosystems;		
9d01	Proportion of population with secure access to provisioning services from ecosystems that support adaptive capacity	This indicator measures the proportion of the population whose livelihoods and basic needs are supported by ecosystems (including food, freshwater, fibre, wild foods, and fisheries) in ways that are climate-resilient and sustainable. It is defined as the proportion (percentage) of the population with secured access to provisioning ecosystem services that remain reliable under climate change scenarios.
9d02	Extent and capacity of regulating ecosystem services that reduce exposure and vulnerability to climate risks/impacts	This indicator measures (a) the extent (area, distribution) of ecosystems that provide regulating services critical for climate risk reduction, and (b) their capacity (biophysical ability) to sustain those services under current conditions and climate change scenarios. It reflects both the spatial coverage of regulating ecosystems and their functional ability to reduce climate risks and impacts.
9d04	Area under restoration for enhancing ecosystem resilience and services	This indicator measures the area of degraded terrestrial, inland water, mountain, marine and coastal ecosystems restored to enhance resilience and the availability of ecosystem services. Restoration is defined to include: (a) restoring converted areas back to natural states; (b) improving the ecological integrity of degraded natural areas; and (c) rehabilitating converted and degraded areas (e.g. degraded agricultural lands) to improve both productivity and integrity.
9d05	Extent of ecosystems that contribute to climate resilience covered by protected areas and other effective area-based conservation measures	This indicator measures the extent of terrestrial, inland water, mountain, marine, and coastal ecosystems that contribute to climate resilience and that are under formal protection, conservation, and sustainable management, including protected areas (PAs) and other effective area-based conservation measures (OECMs). It is defined to measure the percentage area of these ecosystems covered by protected areas or OECMs
9(e) Increasing the resilience of infrastructure and human settlements to climate change impacts to ensure basic and continuous essential services for all, and minimizing climate-related impacts on infrastructure and human settlements		
9e07	Number of Parties that have national adaptation plans, policy instruments and/or	This indicator measures how many countries have National Adaptation Plans (NAPs), policy instruments and/or strategies that explicitly address the risks of overshooting global temperature goals (e.g. exceeding

ID	Indicator Name	Description
	strategies which include a consideration of the impact of temperature goal overshoot on the effectiveness of adaptation in relation to basic infrastructure	1.5°C or 2°C). It captures whether adaptation planning considers higher warming scenarios, not just the Paris Agreement targets.
10(a) Impact, vulnerability and risk assessment: by 2030 all Parties have conducted up-to-date assessments of climate hazards, climate change impacts and exposure to risks and vulnerabilities and have used the outcomes of these assessments to inform their formulation of national adaptation plans, policy instruments, and planning processes and/or strategies, and by 2027 all Parties have established multi-hazard early warning systems, climate information services for risk reduction and systematic observation to support improved climate-related data, information and services		
10a01	Number of Parties that have established multi-hazard early warning systems	Total count of Parties that have reported to have established multi-hazard, end-to-end, and people-centered early warning systems disaggregated by sector and GGA targets. The indicator will be informed by other indicators in this target, based on the standard four pillars of early warning systems (1) disaster risk knowledge based on the systematic collection of data and disaster risk assessments; (2) detection, monitoring, analysis and forecasting of the hazards and possible consequences; (3) dissemination and communication, by an official source, of authoritative, timely, accurate and actionable warnings and associated information on likelihood and impact; and (4) preparedness at all levels to respond to the warnings received.
10a02	Number of Parties that have accessible, understandable, usable, relevant and up to date climate risk information and comprehensive risk assessment	Total count of Parties that have reported to have climate risk information and comprehensive risk assessments that are accessible, understandable, usable, relevant, and up to date. Such risk information generated from comprehensive assessments that address all dimensions of climate-related disaster risk, including hazards, exposure, vulnerability, and capacity, and are based on qualitative and/or quantitative analysis to determine the nature and extent of risk. include the identification of hazards, review of their technical characteristics (such as location, intensity, frequency, and probability), analysis of physical, social, health, environmental, and economic vulnerabilities, evaluation of coping capacities with respect to likely risk scenarios, and analysis of risk drivers and underlying risk factors. [Adapted from SFM Technical Guidance]
10a03	Number of Parties that have multi-hazard monitoring and impact-based forecasting systems, including monitoring stations	Total count of Parties that have reported to have multi-hazard monitoring and forecasting system for each of the major hazards determined by each Party. Where there is higher quality reporting, this indicator may also capture the quality of such systems. [Adapted from SFM Technical Guidance]

ID	Indicator Name	Description
10a04	Number of people per 100,000 that are covered by early warning information through local governments or through national dissemination mechanisms	Total number of people per 100,000 population that are covered by multi-hazard early warning systems. This indicates the degree of progress being made in communication, dissemination, and outreach to populations. At the minimum, this is determined by the reporting of the primary media/mode for early warning information through local governments or through national dissemination mechanisms, such as recognized authorities, mass media (radio, TV, internet, website, email, SMS, social media, app) and local communication systems (siren, public board, phone). If any of these information modes are available, the population is considered covered. [Adapted from SFM Technical Guidance]
10(b) Planning: by 2030 all Parties have in place country-driven, gender responsive, participatory and fully transparent national adaptation plans, policy instruments, and planning processes and/or strategies, covering, as appropriate, ecosystems, sectors, people and vulnerable communities, and have mainstream adaptation in all relevant strategies and plans		
10b01	Number of Parties with adopted national adaptation plans, policy instruments, and planning processes and/or strategies	This indicator tracks the number of Parties that have an adopted national adaptation plan, policy instruments, planning processes and/or strategies as part of their national policy landscape. It reflects the extent to which countries are institutionalizing adaptation planning processes in line with target 10b. The disaggregation gathers (a) information about particular features of those plans and policy instruments, (b) whether separate national sector adaptation plans exist (e.g. a Health National Adaptation Plan), and (c) information about the inclusivity of their planning process
10b02	Number of Parties that have adopted national legislation or other legislative frameworks on adaptation	This indicator measures the number of Parties that have enacted national laws dedicated to climate adaptation. It demonstrates the degree to which adaptation is being embedded in legally binding frameworks, providing a foundation for coordinated and enforceable action.
10b03	Number of Parties receiving or mobilizing international support for formulation of National Adaptation Plans, policy instruments, and planning processes and/or strategies, including capacity development	This indicator tracks the number of Parties that are accessing or mobilizing international finance and technical support for the development of planning processes. It highlights the role of external resources in strengthening national adaptation planning.
10b04	Number of Parties that have in place gender-responsive adaptation plans, policy	This indicator measures the number of Parties that have adopted adaptation plans, policy instruments, and planning processes and/or strategies with explicit gender-responsive provisions. The disaggregation provides further details about gender-responsiveness.

ID	Indicator Name	Description
	instruments, and planning processes and/or strategies	
10b05	Proportion of National Adaptation Plans, policy instruments, and planning processes that have been informed by traditional knowledge, knowledge of Indigenous Peoples, and local knowledge systems	This indicator tracks the share of Parties where Indigenous Peoples, and local communities are actively involved in the development of adaptation plans, and where Indigenous, traditional, and local ways of knowing have informed the creation of NAPs, policy instruments, and planning processes. It reflects the commitment to participatory and inclusive approaches in adaptation planning, and multiple evidence approaches.
10b06	Proportion of local governments that have integrated climate change adaptation into policies, legal frameworks, budgets, plans and processes	This indicator tracks how many local governments have embedded adaptation priorities in local planning frameworks.
10b07	Number of Parties with a legal requirement for public investments to take into account climate risks including in planning, implementation and maintenance	This indicator tracks whether Parties have adopted legal requirements for public investments to take into account climate risks.
10b09	Number of Parties where national budgets reflect adaptation allocations across sectors and ministries and where adaptation is integrated into national and sectoral plans (including development plans and budgets where applicable)	This indicator measures the degree to which national budgets integrate and prioritize adaptation actions identified in planning frameworks, as well as integration of adaptation into other relevant national and sectoral plans.
10b10	Proportion of government budget allocated to climate adaptation and resilience	This indicator measures the share of government expenditure directed to adaptation priorities, reflecting financial commitment to adaptation.
10(c) Implementation: by 2030 all Parties have progressed in implementing their national adaptation plans, policies and strategies and, as a result, have reduced the social and economic impacts of the key climate hazards identified in the assessments referred to in paragraph 10(a) above		

ID	Indicator Name	Description
10c01	Degree of implementation of national adaptation plans, policies and strategies	This indicator measures the degree to which national adaptation plans, including the measurable targets/goals and adaptation measures/actions listed in the national adaptation plans, policies and strategies are implemented. It is proposed to measure two parts: a) the share of measurable targets/goals on track of being achieved; b) proportion of adaptation actions at different levels of implementation (e.g. not started, under implementation, completed)
10c03	Number of people who experienced direct social and economic impacts associated with climate-related hazards per 100,000 people	The first part of the indicator is modified from Sendai Framework Target B, and SDG targets 1.5, 11.5 and 13.1. The specific elements of disaggregation provide information on other targets, e.g. (a) Number of injured or ill people - provides information for Target 9c on health, (b) Number of people with damaged dwellings and (c) Number of people with destroyed dwellings - provide information for Target 9e on IHS, (d) Number of people whose livelihoods were disrupted or destroyed - provides information for Target 9f on poverty and livelihoods. The second part of the indicator is a Gender-Environment Indicator managed by UN Women and components of it are part of the Global Set of Climate Change Statistics and Indicators managed by UNSD. All sub-categories (from A to L) can be disaggregated by climate-related hazard. This indicator also contributes to Target 9c (climate-related injured and ill people), 9e (damaged and destroyed dwellings), and 9f (livelihoods lost due to climate-related hazards). While the indicator captures the absolute number, the analysis is recommended to be done over years to capture change over time to understand and track adaptation effectiveness.
10c10	Number of Parties with institutional arrangements for the provision of regular training on climate change adaptation at the national and local level for governments and non-government organizations including community-based organizations	Institutional arrangements could include designated national training institutes/universities/other private sector providers/Technical and Vocational Institutions with curricula that cover climate change adaptation. "Regular" refers to established courses rather than one-off training exercises.
10c11	Extent of capacity-building interventions enhancing adaptive capacity of vulnerable communities/people	This indicator measures the extent to which capacity building interventions have increased the adaptive capacity of vulnerable people/communities to climate change impacts and hazards. Measured through:

ID	Indicator Name	Description
		(a) Qualitative information on (i) nature of strategies employed for capacity building of the vulnerable people, (ii) existence of a national and subnational policy(ies) that promote the integration of climate change adaptation in school curriculum, including professional training institutes and colleges, (iii) level of engagement of vulnerable people in capacity building interventions and (iv) level of the measures implemented to address the capacity building needs, priorities, and gaps identified in CNAs; and (b) Quantitative data on (i) proportion of vulnerable people reached by capacity building interventions, (ii) proportion of vulnerable people with improved skills to adapt including diversifying livelihoods away from climate sensitive sectors, (iii) number of adaptation-related research and development programs integrating indigenous and traditional knowledge in various levels of education (from primary, secondary, high school and post-school such as vocational training colleges and universities).

Source: United Nation Climate Change. Accessed October 22, 2025. [Final list of potential indicators, UAE–Belém work programme on indicators | UNFCCC](#)

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